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REAC

OFFICE OF EMERGENCY AND REMEDIAL RESPONSE

FINAL REPORT

# FIELD ECOLOGICAL ASSESSMENT

NATIONAL LEAD SITE
PEDRICKTOWN, SALEM COUNTY, NJ

JUNE 1993

Appendices A to E

PREPARED BY:

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AND

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Environmental Response Branch
Emergency Response Division
Office of Emergency & Remedial Response

FINAL REPORT
ECOLOGICAL ASSESSMENT
NATIONAL LEAD SITE
PEDRICKTOWN, SALEM COUNTY, NJ
NOVEMBER 1992

VOLUME 2 OF 3

U.S. EPA WORK ASSIGNMENT NO.: 3-643
WESTON WORK ORDER NO.: 3347-033-001-4643
U.S. EPA CONTRACT NO.: 68-03-3482

/bovitz/fr-4643

# Appendix A

Appendix A

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APPENDIX A
Final XRF Analytical Report
National Lead Site

/bovitz/fr-4643

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WESTON
MANAGERS DESIGNERS CONSULTANTS

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DATE: September 2, 1992

TO: Mark Sprenger, U.S. EPA/ERT

FROM: Maria L. Pueyo, Field Chemist

THRU: Vinod Kansal, REAC Section Chief

RE: National Lead Spectrace 9000 XRF Analytical Results

The following sample results were thought to be only for X-Met 880 calibration purposes and were omitted from the Final XRF Analytical Report. These sediments were taken at frog sampling locations. Results are in milligram per kilogram (mg/kg).

| SAMPLE ID | Cr | Pb | Cd |
|---|---|---|---|
| WS-FS | ND(1) | 4524 | ND |
| WS-FS DUP | ND | 4611 | ND |
| 130FSB | ND | 835 | ND |
| 130FSC | ND | 886 | ND |
| 130FSD | ND | 1352 | ND |
| ES-FS | ND | 549 | ND |
| ES-FS DUP | ND | 782 | ND |

(1)ND-denotes not detected
Minimum Detection Limit: Cr=612, Pb=42, Cd=192
Minimum Quantitation Limit: Cr=2040, Pb=140, Cd=640

cc: Dave Mickunas
Larry Kaelin
Paul Bovitz

lak\PUEYO\M-13

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TABLE 1
SPECTRACE 9000 XRF RESULTS
*IN-SITU* ANALYSIS OF SOIL SAMPLES
NORTH AREA (AREA IA)
NATIONAL LEAD SITE
PEDRICKSTOWN, SALEM CO., NJ
25-27 AUGUST 1992

| SAMPLE ID | Pb (mg/kg) |
|---|---|
| N1 | 845 |
| N2 | 2914 |
| N3 | 904 |
| N4 | 2378 |
| N5 | 1430 |
| N6 | 1729 |
| N7 | 2325 |
| N8 | 1955 |
| N9 | 287 |
| N10 | 2025 |
| N11 | 803 |
| N12 | 2183 |
| N13 | 1450 |
| N14 | 737 |
| N15 | 764 |
| AVERAGE | 1515 |

DETECTION LIMIT: 41
QUANTITATION LIMIT: 137

TABLE 2
SPECTRACE 900 XRF RESULTS
*IN-SITU* ANALYSIS OF SOIL SAMPLES
NORTH AREA (AREA IA)
NATIONAL LEAD SITE
PEDRICKSTOWN, SALEM CO., NJ
25-27 AUGUST 1992

| SAMPLE ID | Pb (mg/kg) |
|---|---|
| EE1 | 982 |
| EE2 | 4024 |
| EE3 | 1413 |
| EE4 | 1633 |
| EE5 | 2338 |
| EE6 | 4744 |
| EE7 | 2085 |
| EE8 | 2429 |
| EE9 | 1599 |
| EE10 | 4930 |
| AVERAGE | 2618 |

DETECTION LIMIT: 41
QUANTITATION LIMIT: 137

FINAL XRF ANALYTICAL REPORT
NATIONAL LEAD SITE
PEDRICKTOWN, NEW JERSEY

AUGUST 1992

U.S. EPA Work Assignment No.: 3-643
Weston Work Order No.: 3347-31-01-4643
U.S. EPA Contract No.: 68-03-3482

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ldm/pueyo/fr-4643

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## 1.0 INTRODUCTION

### 1.1 Site Background

The National Lead Site is located in Pedricktown, Salem County, in the state of New Jersey. It is an abandoned secondary lead smelting facility situated on 44 acres, approximately 1.5 miles east of the Delaware River. From 1972 to 1984, lead batteries and other lead materials were handled by this facility. The areas under investigation at this site include two roughly parallel streams which run along the east and west sides of the facility, forested areas and wetlands associated with these streams.

The contaminants of concern are chromium (Cr), lead (Pb) and cadmium (Cd). Surface soil at this site has been previously characterized and was found to contain lead in concentrations ranging from 35 milligrams per kilogram (mg/kg) to above 20,200 mg/kg.

### 1.2 Objective of this Study

The United States Environmental Protection Agency/Environmental Response Team (U.S. EPA/ERT) was requested by the U.S. EPA Region II to provide technical assistance in assessing potential ecological risks at the National Lead Site. The U.S. EPA Work Assignment Manager, Mark Sprenger, issued a work assignment to the Response Engineering and Analytical Contract (REAC) to provide field and analytical support to meet the above objective.

This on-going project consists of terrestrial and aquatic components. The terrestrial component consists of studies of the bioaccumulation of Pb in small mammals and earthworms. The aquatic component addresses the potential effect of Pb in the previously mentioned streams through sediment toxicity and bioaccumulation studies. The Spectrace 9000 X-ray fluorescence (XRF) spectrometer was used to determine the surface soil and sediments' level of Cr, Pb, and Cd contamination to ensure the validity of reference locations. The Work Assignment Manager requested that the study focus on lead as the primary target analyte, and chromium and cadmium as secondary target analytes.

This report documents the methodologies used and the results produced by the Spectrace 9000 XRF.

## 2.0 METHODOLOGY

### 2.1 Sampling Summary

A preliminary site visit was conducted on June 17, 1992. During this visit, transects were run through the forested areas due east of the site, and a brief soil contamination study was conducted with the Spectrace 9000 XRF.

Two additional sampling efforts were performed by the U.S. EPA/ERT and REAC. The first was conducted on June 24 through 26, 1992. During this site visit, surface soils were screened in-situ for Cr, Pb, and Cd using the Spectrace 9000 XRF. In-situ earthworm bioaccumulation chambers were subsequently placed in 20 locations representing different Pb concentrations identified with the XRF in the preliminary site visit and during this phase of the investigation. In-situ XRF readings were also taken of sieved, homogenized composite samples obtained by mixing soil removed from each earthworm chamber location.

A second sampling effort was conducted on August 11 and 12, 1992. During this visit, an XRF screening of the sediment in both previously mentioned streams was conducted in order to select five sampling locations for sediment toxicity testing.

## 2.2 Spectrace 9000 In-Situ Surface Soil Analysis

A 6-inch by 6-inch area of soil was prepared by removing all oversized material and organic matter from the soil surface. This area was homogenized to approximately a 1-inch depth and flattened with a stainless steel spoon. The Spectrace 9000 XRF measurement probe was placed directly on the prepared area for analysis.

The Spectrace 9000 XRF soil analysis was initiated using a 60-second live-measuring time, a 30-second live-measuring time, and a 60-second live-measuring time on the Cd-109, Fe-55 and Am-241 sources, respectively. A replicate measurement was obtained at some surface sampling locations by moving the Spectrace 9000 XRF measurement probe to a second point within the prepared area. After a few measurements, a decision was made by the Work Assignment Manager to proceed with only one XRF reading per location due to time constraints. A summary table including the two Cr, Pb, and Cd measurements, when available, is in Appendix A. The data was qualified using the target elements' minimum detection and quantitation limits as described in Section 2.5 of this report. When available, an average of the two Cr, Pb, and Cd measurements obtained at each surface location, as well as the qualified Cr, Pb, and Cd data, are in Table 1. In Table 1, sample numbers preceded by the letters E and W were collected in the east and west forested areas, respectively. A sample homogenate is preceded by the letter H. Some sample homogenates were diluted with clay to obtain the desired Pb concentration. These samples have the postscript DIL in their sample number.

The sample number and the Cr, Pb, and Cd XRF analysis results were logged into a field instrument logbook. In addition, the sample number, XRF analysis reports, and XRF spectra for the samples were saved in the internal XRF data logger. This data was subsequently downloaded and archived on computer disks. A disk copy of this data is in the REAC Central File. A photocopy of the field instrument logbook and a printout of the Spectrace 9000 analytical reports are in Appendix A.

XRF analytical results were confirmed by Atomic Absorption (AA) for 20 locations selected as reference sites for earthworm Pb bioaccumulation studies. Samples from these locations were submitted for chemical digestion and metals analysis. The confirmatory metal analysis results are in Table 2.

## 2.3 Spectrace 9000 Sediment Sample Cup Analysis

Because sediment is saturated, the in-situ approach taken for surface soils could not be followed. Rather, a 5-gallon pail of sediment was collected by the sampling teams for each sampling location. The sediment in each pail was homogenized by stirring with a stainless steel trowel for approximately five minutes. A set of three distinct sediment samples was obtained from each pail, as a measure of the heterogeneity of the sample. Rocks and organic matter were removed from the sediment prior to collecting three 2 to 3 grams of sediment in labelled aluminum weighing boats. The samples were then oven-dried.

After drying, the sediment was broken up, and all oversized material, rocks and organic matter were discarded. The remainder of the sediment was homogenized.

A 31-millimeter (mm) polyethylene X-ray sample cup was labelled and filled with sediment. The cup was then sealed with a piece of 0.2 mm polypropylene X-ray window film. Prior to XRF analysis, the sample cup was tapped gently against a hard surface to pack the sediment evenly against the window film.

The sample cup was placed directly on the Spectrace 9000 measurement probe for analysis. The Spectrace 9000 XRF analysis was initiated using a 60-second live-measuring time, a 30-second live-measuring time, and a 60-second live-measuring time on the Cd-109, Fe-55, and Am-241 sources, respectively.

The sample number and the Cr, Pb, and Cd XRF analysis results were logged into a field instrument logbook. In addition, the sample number, XRF analysis reports, and XRF spectra for the samples were saved in the internal XRF data logger. This data was subsequently downloaded and archived on computer disks. A disk copy of this data is stored in the REAC Central File. A photocopy of the field instrument logbook and printouts of the Spectrace 9000 analytical reports are in Appendix A.

The data was qualified using the target elements minimum detection and quantitation limits as described in Section 2.5 of this report. The qualified Cr, Pb, and Cd data is in Table 1.

XRF Analytical results were confirmed by AA for five locations selected as reference sites for sediment toxicity studies. One of the three XRF sample cups obtained from each of these sampling locations was submitted for chemical digestion and metals analysis. The confirmatory metals analysis results are in Table 3.

2.4 Spectrace 9000 Application Model Verification and Precision Check

In order to evaluate and document the quality of the analytical field data obtained with the Spectrace 9000 XRF, the following criteria were met. The Spectrace 9000 soil application fundamental parameters model was verified at the beginning of each day. This was done by analyzing a low, two mid and high Pb concentration soil standards, 4330D, 4500B, 4327C, and 4497B, respectively, from the Brown's Battery Breakage Site. The results of these analyses are presented in Table 4. A copy of the Brown's Battery Breakage Site metals analysis results is in Appendix B. The mid-concentration standards (4500B and 4327C) were analyzed periodically to establish the instrument precision near the site action level of 1000 mg/kg Pb. All standard deviations with a decimal fraction were rounded up to the next whole number prior to the coefficient of variation calculation. The results of these analyses are presented in Table 4.

2.5 Spectrace 9000 Minimum Detection and Quantitation Limits

A low standard from the Brown's Battery Breakage Site 4328D, Pb chemically analyzed value at 7 mg/kg, was analyzed periodically throughout the analysis day in addition to the application model verification and precision measurements. The standard deviation of these non-consecutive analyses was used to calculate the field instrument method Minimum Detection and Quantitation Limit. The Minimum Detection and Quantitation Limit were calculated as three and 10 times the standard deviation of the non-consecutive measurements, respectively. Standard deviations with a decimal fraction were rounded up to the next whole number prior to the Minimum Detection and Quantitation Limit calculation. The results of these analyses are presented in Table 5.

## 3.0 RESULTS

Printouts of all Spectrace 9000 analytical reports are in Appendix A. Computer disk copies of all Spectrace 9000 analytical reports and spectra are stored in the REAC Central File. A results table with the Cr, Pb, and Cd sample results is in Appendix A.

The qualified Cr, Pb and Cd sample results (average results when two measurements were taken) are in Table 1.

The Spectrace 9000 XRF and confirmatory metals analysis results are in Tables 2 and 3. Confirmatory metals analysis results have not undergone Quality Assurance/Quality Control Evaluation at this time.

The Spectrace 9000 application model verification and precision check results are in Table 4.

The Spectrace 9000 minimum detection and quantitation limits are in Table 5.

## 4.0 DISCUSSION OF RESULTS

Results obtained with the Spectrace 9000 XRF indicate that lead is the major contaminant at the National Lead Site. This is consistent with expectations, in accordance with the historical lead smelting activities carried out at the facility. Soil lead concentrations were typically higher at the soil surface, generally diminishing with soil depth. A detailed interpretation of the data, including site maps, will be presented in the National Lead Final Report.

Table 1
Spectrace 9000 Chromium, Lead and Cadmium
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| E1 | ND[1] | 3041 | ND |
| E1 6" S | ND | 1537 | ND |
| HE1 | ND | 1035 | ND |
| E2 | ND | 1001 | ND |
| HE2 | ND | 216 | ND |
| E3 | ND | 626 | ND |
| E4 | ND | 888 | ND |
| HE4 | ND | 435 | ND |
| E5 | ND | 518 | ND |
| E6 | ND | 410 | ND |
| E7 | ND | 640 | ND |
| E8 | ND | 411 | ND |
| E9 | ND | 885 | ND |
| E10 | ND | 324 | ND |
| E11 | ND | 211 | ND |
| HE11 | ND | 169 | ND |
| E12 | ND | 902 | ND |
| E13 | ND | 413 | ND |
| E14 | ND | 265 | ND |
| E15 | ND | 171 | ND |
| E16 | ND | 2819 | ND |
| HE16 | ND | 313 | ND |
| E17 | ND | 2015 | ND |
| HE17 | ND | 1351 | ND |
| E18 | ND | 915 | ND |
| E19 | ND | 1501 | ND |
| E19 2' S | ND | 1146 | ND |
| HE19 | ND | 859 | ND |
| E20 | ND | 879 | ND |
| E21 | ND | 429 | ND |
| E22 | ND | 1863 | ND |
| E23 | ND | 1840 | ND |
| E24 | ND | 70J[2] | ND |
| E26 | ND | 1042 | ND |
| E27 | ND | 2031 | ND |
| E28 | ND | 350 | ND |
| HE28 | ND | 241 | ND |

(1) ND - denotes not detected
(2) J - denotes value is below quantitation limit
Minimum Detection Limit: Cr = 612, Pb = 42, Cd = 192
Minimum Quantitation Limit: Cr = 2040, Pb - 140, Cd = 640

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Table 1 (CONT'D)
Spectrace 9000 Chromium, Lead and Cadmium
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| E29 | ND | 3969 | ND |
| E29 2' S | ND | 399 | ND |
| W1 | ND | 3937 | ND |
| HW1 | ND | 2941 | ND |
| W2 | ND | 853 | ND |
| W3 | ND | 2149 | ND |
| W4 | ND | 2518 | ND |
| W4 2' S | ND | 485 | ND |
| HW4 | ND | 1234 | ND |
| W5 | ND | 1746 | ND |
| HW5 | ND | 1446 | ND |
| W6 | ND | 926 | ND |
| W7 | ND | 1885 | ND |
| HW7 | ND | 2089 | ND |
| W8 | ND | 2048 | ND |
| W8 1" D | ND | 707 | ND |
| W8 10" D | ND | 98J | ND |
| W9 | ND | 3088 | ND |
| HW9 | ND | 1737 | ND |
| W10 | ND | 148 | ND |
| W11 | ND | 2289 | ND |
| W11 1" D | ND | 2571 | ND |
| W11 4"-5" D | ND | 2084 | ND |
| W12 | ND | 2846 | ND |
| HW12 | ND | 5371 | ND |
| W13 SOIL | ND | 737 | ND |
| W13 HUMUS | ND | 2902 | ND |
| W14 | ND | 4344 | ND |
| HW14 | ND | 4322 | ND |
| W15 | ND | 2415 | ND |
| W16 | ND | 2706 | ND |
| HW16 | ND | 3640 | ND |
| W17 | ND | 4106 | ND |
| W18 | ND | 3184 | ND |
| HW18 | ND | 9401 | ND |
| HW18 DIL | ND | 6322 | ND |

(1) ND - denotes not detected
(2) J - denotes value is below quantitation limit
Minimum Detection Limit: Cr = 612, Pb = 42, Cd = 192
Minimum Quantitation Limit: Cr = 2040, Pb - 140, Cd = 640

Table 1 (CONT'D)
Spectrace 9000 Chromium, Lead and Cadmium
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| W19 | ND | 9965 | ND |
| HW19 | ND | 8967 | ND |
| W20 | ND | 12737 | ND |
| HW20 | ND | 10082 | ND |
| W21 | ND | 8108 | ND |
| W22 | ND | 5394 | ND |
| W22 3" D | ND | 2807 | ND |
| HW22 | ND | 6777 | ND |
| HW22 DIL | ND | 2571 | ND |
| W23 | ND | 6439 | ND |
| W24 | ND | 4403 | ND |
| W25 | ND | 2867 | ND |
| W26 | ND | 6014 | ND |
| W27 | ND | 3212 | ND |
| W28 | ND | 1630 | ND |
| W29 | ND | 1108 | ND |
| 1B | ND | 459 | ND |
| 1C | ND | 386 | ND |
| 1D | ND | 576 | ND |
| 2B | ND | 693 | ND |
| 2C | ND | 522 | ND |
| 2D | ND | 651 | ND |
| 3B | ND | ND | ND |
| 3C | ND | ND | ND |
| 3D | ND | ND | ND |
| 4B | ND | 1041 | ND |
| 4C | ND | 984 | ND |
| 4D | ND | 946 | ND |
| 4D DUP | ND | 964 | ND |
| 5B | ND | ND | ND |
| 5C | ND | ND | ND |
| 5D | ND | ND | ND |
| 6B | ND | 376 | ND |
| 6B DUP | ND | 488 | ND |
| 6C | ND | 386 | ND |
| 6D | ND | 453 | ND |

(1) ND - denotes not detected
(2) J - denotes value is below quantitation limit
Minimum Detection Limit: Cr = 612, Pb = 42, Cd = 192
Minimum Quantitation Limit: Cr = 2040, Pb - 140, Cd = 640

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Table 1 (CONT'D)
Spectrace 9000 Chromium, Lead and Cadmium
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| 7B | ND | 959 | ND |
| 7C | ND | 897 | ND |
| 7D | ND | 1033 | ND |
| 8B | ND | 5600 | ND |
| 8C | ND | 5810 | ND |
| 8D | ND | 6126 | ND |
| 8D DUP | ND | 5503 | ND |
| 9B | ND | 325 | ND |
| 9C | ND | 359 | ND |
| 9C DUP | ND | 416 | ND |
| 9D | ND | 306 | ND |
| 10B | ND | 939 | ND |
| 10C | ND | 1029 | ND |
| 10D | ND | 1208 | ND |
| 11B | ND | 5933 | ND |
| 11C | ND | 4147 | ND |
| 11D | ND | 7674 | ND |
| 12B | ND | 1128 | ND |
| 12C | ND | 1237 | ND |
| 12D | ND | 1086 | ND |
| 12D DUP | ND | 1271 | ND |
| 13B | 1124J | 20670 | ND |
| 13C | ND | 19305 | ND |
| 13D | ND | 19492 | ND |
| 14B | ND | 45J | ND |
| 14C | ND | 53J | ND |
| 14D | ND | 72J | ND |
| 15B | ND | 938 | ND |
| 15B DUP | ND | 838 | ND |
| 15C | ND | 1331 | ND |
| 15D | ND | 895 | ND |
| 16B | ND | ND | ND |
| 16C | ND | ND | ND |
| 16D | ND | ND | ND |
| 17B | ND | 1100 | ND |
| 17C | ND | 1099 | ND |
| 17D | ND | 1262 | ND |

(1) ND - denotes not detected
(2) J - denotes value is below quantitation limit
Minimum Detection Limit: Cr = 612, Pb = 42, Cd = 192
Minimum Quantitation Limit: Cr = 2040, Pb - 140, Cd = 640

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Table 2
Spectrace 9000 XRF and Confirmatory
Metals Analysis Results
Lead in Soil (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| REAC SAMPLE ID | CLIENT SAMPLE ID | EARTHWORM BIOACCUMULATION CHAMBER LOCATION | SPECTRACE 9000 mg/kg Pb | METAL ANALYSIS mg/kg Pb |
|---|---|---|---|---|
| HE16 | A15833 | 1 | 313 | 290 |
| HE2 | A15834 | 2 | 216 | 190 |
| HE1 | A15835 | 3 | 1035 | 810 |
| HE11 | A15836 | 4 | 169 | 180 |
| HE17 | A15838 | 5 | 1351 | 1100 |
| HE19 | A15840 | 6 | 859 | 720 |
| HE4 | A15841 | 7 | 435 | 450 |
| HW1 | A15842 | 8 | 2941 | 1800 |
| HW12 | A15843 | 9 | 5371 | 3500 |
| HW4 | A15844 | 10 | 1234 | 830 |
| HW5 | A15845 | 11 | 1446 | 1300 |
| HW9 | A15846 | 12 | 1737 | 1600 |
| HW7 | A15847 | 13 | 2089 | 1500 |
| HW14 | A15848 | 14 | 4322 | 2200 |
| HW16 | A15849 | 15 | 3640 | 1800 |
| HW18 | A15850 | 16 | 9401 | 6700 |
| HW19 | A15851 | 17 | 8967 | 6800 |
| HW20 | A15852 | 18 | 10082 | 6900 |
| HW22DIL | A15853 | 19 | 2571 | 2600 |
| HE28 | A15854 | 20 | 241 | 120 |
| Minimum Detection Limit = | | | 42 | 5 |
| Minimum Quantitation Limit = | | | 140 | NA[1] |

(1) NA - denotes not available.

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Table 3
Spectrace 9000 XRF and Confirmatory
Metals Analysis Results
Lead in Sediment (mg/kg)
National Lead Site
Pedricktown, New Jersey
August 11-12, 1992

| REAC SAMPLE ID | CLIENT SAMPLE ID | SPECTRACE 9000 mg/kg Pb | METAL ANALYSIS mg/kg Pb |
|---|---|---|---|
| 2 D | 14662 D | 651 | 670 |
| 4 D | 14663 D | 946 | 1100 |
| 5 D | 14664 D | ND(1) | 53 |
| 8 C | 15875 C | 5810 | 4400 |
| 9 B | 15876 B | 325 | 260 |
| Minimum Detection Limit = | | 42 | 5 |
| Minimum Quantitation Limit = | | 140 | NA(2) |

(1) ND - denotes not detected.
(2) NA - denotes not available.

Table 4
Spectrace 9000 XRF
Lead Results (mg/kg)
Application Model Verification and Precision Data
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| SAMPLE NUMBER | Pb | % DIFFERENCE |
|---|---|---|
| 4330D(1) | 172 | 7.5 |
| 4330D | 108 | 32.5 |
| 4330D | 227 | 41.9 |
| 4330D | 174 | 8.8 |
| 4330D | 104 | 35.0 |
| 4330D | 104 | 35.0 |

| SAMPLE NUMBER | Pb | % DIFFERENCE |
|---|---|---|
| 4497B(2) | 11602 | 3.3 |
| 4497B | 11402 | 5.0 |
| 4497B | 11537 | 3.9 |
| 4497B | 11296 | 5.9 |
| 4497B | 10639 | 11.3 |
| 4497B | 11278 | 6.0 |

| SAMPLE NUMBER | Pb | % DIFFERENCE |
|---|---|---|
| 4327C(3) | 1104 | 0.4 |
| 4327C | 1110 | 0.9 |
| 4327C | 952 | 13.5 |
| 4327C | 1108 | 0.7 |
| 4327C | 1111 | 1.0 |
| 4327C | 1055 | 4.1 |
| 4327C | 1084 | 1.5 |
| 4327C | 990 | 10.0 |
| 4327C | 1018 | 7.5 |
| 4327C | 1020 | 7.3 |
| 4327C | 1023 | 7.0 |
| 4327C | 1008 | 8.4 |
| Mean = 1049<br>Standard Deviation = 52<br>Coefficient of Variation = 5.0 | | |

(1) Brown's Battery Site standard chemical analysis results = 160 mg/kg Pb
(2) Brown's Battery Site standard chemical analysis results = 12000 mg/kg Pb
(3) Brown's Battery Site standard chemical analysis results = 1100 mg/kg Pb
(4) Brown's Battery Site standard chemical analysis results = 1600 mg/kg Pb

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Table 4 (CONT'D.)
Spectrace 9000 XRF
Lead Results (mg/kg)
Application Model Verification and Precision Data
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| SAMPLE NUMBER | Pb | % DIFFERENCE |
|---|---|---|
| 4500B[4] | 1880 | 17.5 |
| 4500B | 1848 | 15.5 |
| 4500B | 1884 | 17.8 |
| 4500B | 1799 | 12.4 |
| 4500B | 1699 | 6.2 |
| 4500B | 1845 | 15.3 |
| 4500B | 1844 | 15.3 |
| 4500B | 1806 | 12.9 |
| 4500B | 1707 | 6.7 |
| 4500B | 1724 | 7.8 |
| 4500B | 1867 | 16.7 |
| 4500B | 1798 | 12.4 |
| 4500B | 1745 | 9.1 |
| 4500B | 1710 | 6.9 |
| 4500B | 1742 | 8.9 |
| 4500B | 1667 | 4.2 |
| Mean = 1785<br>Standard Deviation = 70<br>Coefficient of Variation = 4.0 | | |

(1) Brown's Battery Site standard chemical analysis results = 160 mg/kg Pb
(2) Brown's Battery Site standard chemical analysis results = 12000 mg/kg Pb
(3) Brown's Battery Site standard chemical analysis results = 1100 mg/kg Pb
(4) Brown's Battery Site standard chemical analysis results = 1600 mg/kg Pb

Table 5
Spectrace 9000 Chromium, Lead and Cadmium
XRF Results (mg/kg)
Minimum Detection and Quantitation Limits
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| SAMPLE NUMBER | Cr | Pb | Cd |
|---|---|---|---|
| 4328D | 313 | 13 | 178 |
| 4328D | -101 | 3 | 11 |
| 4328D | -27 | 3 | 80 |
| 4328D | 6 | 24 | 2 |
| 4328D | 31 | 4 | 136 |
| 4328D | -79 | -2 | 77 |
| 4328D | -230 | 12 | -32 |
| 4328D | -192 | 2 | 13 |
| 4328D | -186 | -2 | 169 |
| 4328D | -113 | 12 | 4 |
| 4328D | -117 | 26 | 5 |
| 4328D | -162 | 10 | 150 |
| 4328D | -168 | -5 | 139 |
| 4328D | 78 | -1 | -91 |
| 4328D | -149 | 0 | 127 |
| 4328D | -389 | 1 | 50 |
| 4328D | -402 | 18 | 80 |
| 4328D | 56 | -5 | 65 |
| 4328D | 425 | 12 | 135 |
| 4328D | -251 | 12 | 152 |
| 4328D | 31 | 21 | 35 |
| 4328D | -14 | 26 | 18 |
| 4328D | 389 | 22 | 89 |
| 4328D | 323 | -6 | 43 |
| 4328D | -36 | 24 | 29 |
| 4328D | 157 | -15 | -8 |
| 4328D | -208 | -17 | 29 |
| 4328D | -92 | 15 | 87 |
| 4328D | -153 | 28 | 102 |
| 4328D | 50 | 31 | 72 |
| 4328D | 201 | 5 | 132 |
| 4328D | -254 | 38 | 152 |
| 4328D | -259 | 13 | 93 |
| Standard Deviation | 204 | 14 | 64 |
| MDL | 612 | 42 | 192 |
| Quantitaion Limit | 2040 | 140 | 640 |

MDL - denotes minimum detection limit

ldm/pueyo/fr-4643

APPENDIX A
Spectrace 9000 Analytical Reports,
Table Summary of Target Element Results and Field Data
National Lead Site

Target Analyte Summary
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| E1 | --- | 2749 | --- |
| E1 REP | --- | 3333 | --- |
| E1 6" S | 336 | 1036 | --- |
| E1 6" S REP | --- | 2037 | --- |
| HE1 | --- | 1053 | --- |
| HE1 REP | --- | 1016 | --- |
| E2 | --- | 1152 | --- |
| E2 REP | --- | 1280 | --- |
| E2 REP 2 | --- | 573 | --- |
| HE2 | --- | 152 | --- |
| HE2 REP | --- | 279 | 53 |
| E3 | --- | 573 | --- |
| E3 REP | --- | 678 | --- |
| E4 | --- | 1026 | --- |
| E4 REP | --- | 749 | --- |
| HE4 | --- | 435 | --- |
| E5 | --- | 574 | --- |
| E5 REP | --- | 461 | --- |
| E6 | --- | 395 | --- |
| E6 REP | --- | 424 | --- |
| E7 | 568 | 640 | --- |
| E8 | --- | 411 | --- |
| E9 | --- | 885 | --- |
| E10 | --- | 324 | 70 |
| E11 | --- | 195 | --- |
| E11 REP | --- | 227 | 54 |
| HE11 | --- | 155 | 58 |
| HE11 REP | --- | 182 | --- |
| E12 | --- | 902 | --- |
| E13 | --- | 383 | 86 |
| E13 REP | --- | 443 | --- |
| E14 | --- | 265 | --- |
| E15 | --- | 171 | --- |
| E16 | 224 | 2819 | --- |
| HE16 | --- | 403 | --- |
| HE16 REP | 233 | 223 | --- |
| E17 | --- | 2015 | --- |
| HE17 | --- | 1272 | --- |
| HE17 REP | --- | 1430 | --- |
| E18 | --- | 915 | --- |

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Target Analyte Summary (cont'd)
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| E19 | --- | 1505 | --- |
| E19 2' S | --- | 1146 | --- |
| HE19 | --- | 859 | --- |
| E20 | --- | 879 | --- |
| E21 | --- | 429 | --- |
| E22 | --- | 1863 | --- |
| E23 | --- | 1840 | --- |
| E24 | --- | 70 | --- |
| E26 | 488 | 1042 | --- |
| E27 | 216 | 2031 | --- |
| E28 | --- | 438 | --- |
| E28 REP | 320 | 281 | --- |
| HE28 | --- | 190 | --- |
| HE28 REP | 511 | 291 | --- |
| E29 | --- | 3979 | --- |
| E29 REP | --- | 3958 | --- |
| E29 2' S | --- | 332 | --- |
| E29 2' S REP | --- | 466 | --- |
| W1 | --- | 4177 | --- |
| W1 REP | --- | 4455 | --- |
| W1 REP 2 | --- | 3179 | --- |
| HW1 | --- | 2941 | --- |
| W2 | 271 | 853 | --- |
| W3 | 499 | 2149 | --- |
| W4 | --- | 1571 | --- |
| W4 REP | --- | 3465 | --- |
| W4 2' S | --- | 485 | --- |
| HW4 | --- | 1234 | --- |
| W5 | --- | 1211 | --- |
| W5 REP | --- | 2281 | --- |
| HW5 | --- | 1446 | --- |
| W6 | --- | 926 | --- |
| W7 | --- | 1776 | --- |
| W7 REP | --- | 1994 | --- |
| HW7 | --- | 2120 | --- |
| HW7 REP | --- | 2058 | --- |
| W8 | --- | 2048 | --- |
| W8 1" D | 219 | 713 | --- |
| W8 1" D REP | 136 | 701 | --- |
| W8 10" D | --- | 98 | --- |

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NLI 002 1255

Target Analyte Summary (cont'd)
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| W9 | --- | 2391 | --- |
| W9 REP | --- | 4673 | --- |
| W9 REP 2 | --- | 2200 | --- |
| HW9 | --- | 1737 | --- |
| W10 | 184 | 148 | --- |
| W11 | --- | 2289 | --- |
| W11 1" D | --- | 2571 | --- |
| W11 3"-5" D | 241 | 2084 | --- |
| W12 | --- | 2846 | --- |
| HW12 | --- | 5638 | --- |
| HW12 REP | --- | 5103 | --- |
| W13 SOIL | --- | 737 | --- |
| W13 HUMUS | --- | 2902 | --- |
| W14 | 228 | 4344 | --- |
| HW14 | 93 | 4322 | --- |
| W15 | --- | 2373 | --- |
| W15 REP | --- | 2456 | --- |
| W16 | --- | 2927 | --- |
| W16 REP | --- | 2484 | --- |
| HW16 | --- | 3640 | --- |
| W17 | --- | 4106 | --- |
| W18 | --- | 3184 | --- |
| HW18 | --- | 9259 | --- |
| HW18 REP | --- | 9542 | 130 |
| HW18 DIL | --- | 5833 | --- |
| HW18 DIL REP | --- | 6810 | --- |
| W19 | --- | 9586 | --- |
| W19 REP | 462 | 10343 | --- |
| HW19 | --- | 8967 | --- |
| W20 | --- | 12737 | --- |
| HW20 | --- | 9403 | --- |
| HW20 REP | 373 | 10761 | --- |
| W21 | --- | 8108 | --- |
| W22 | --- | 5394 | 105 |
| W22 3" D | --- | 2807 | --- |
| HW22 | --- | 6777 | --- |
| HW22 DIL | --- | 2571 | --- |
| W23 | 288 | 6439 | --- |
| W24 | 228 | 4403 | --- |
| W25 | --- | 2619 | --- |
| W25 REP | --- | 3115 | --- |

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Target Analyte Summary (cont'd)
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| W26 | --- | 6014 | --- |
| W27 | 510 | 3212 | --- |
| W28 | --- | 1630 | 155 |
| W29 | --- | 1108 | --- |
| 1B | 488 | 459 | --- |
| 1C | 475 | 386 | --- |
| 1D | 463 | 576 | --- |
| 2B | --- | 693 | --- |
| 2C | --- | 522 | --- |
| 2D | --- | 651 | --- |
| 3B | --- | 32 | 91 |
| 3C | --- | 36 | 102 |
| 3D | --- | 37 | 51 |
| 4B | --- | 1041 | --- |
| 4C | 267 | 984 | --- |
| 4D | --- | 946 | --- |
| 4D DUP | --- | 964 | 62 |
| 5B | --- | 12 | --- |
| 5C | --- | 42 | 77 |
| 5D | 461 | 40 | --- |
| 6B | --- | 376 | --- |
| 6B DUP | --- | 488 | --- |
| 6C | --- | 386 | --- |
| 6D | --- | 453 | --- |
| 7B | 455 | 959 | --- |
| 7C | --- | 897 | --- |
| 7D | --- | 1033 | --- |
| 8B | 391 | 5600 | --- |
| 8C | 526 | 5810 | --- |
| 8D | --- | 6126 | --- |
| 8D DUP | 394 | 5503 | 138 |
| 9B | --- | 325 | 48 |
| 9C | --- | 359 | 109 |
| 9C DUP | --- | 416 | 58 |
| 9D | --- | 306 | 72 |
| 10B | 279 | 939 | 137 |
| 10C | --- | 1029 | 55 |
| 10D | --- | 1208 | 100 |
| 11B | 355 | 5933 | 49 |
| 11C | 199 | 4147 | --- |
| 11D | --- | 7674 | 99 |

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NLI 002 1257

Target Analyte Summary (cont'd)
XRF Results (mg/kg)
National Lead Site
Pedricktown, New Jersey
June 17, June 24-26 and August 11-12, 1992

| Sample ID | Cr | Pb | Cd |
|---|---|---|---|
| 12B | --- | 1128 | 168 |
| 12C | --- | 1237 | --- |
| 12D | 254 | 1086 | 51 |
| 12D DUP | --- | 1271 | --- |
| 13B | 1124 | 20670 | 94 |
| 13C | --- | 19305 | 92 |
| 13D | --- | 19492 | --- |
| 14B | --- | 45 | 120 |
| 14C | --- | 53 | 62 |
| 14D | 259 | 72 | 163 |
| 15B | --- | 938 | --- |
| 15B DUP | 594 | 838 | 83 |
| 15C | 210 | 1331 | 159 |
| 15D | --- | 895 | 89 |
| 16B | --- | --- | --- |
| 16C | 186 | 41 | 160 |
| 16D | --- | 36 | --- |
| 17B | --- | 1100 | --- |
| 17C | --- | 1099 | --- |
| 17D | --- | 1262 | 51 |

pat\PUEYO\target.sum

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 10:42:32
ID: <ECAL>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 1801.68 | 579.952 | ppm |
| K | 1599.33 | 265.432 | ppm |
| Ca | 12045.1 | 313.388 | ppm |
| CrLO | 458.896 | 132.214 | ppm |
| Mn | 788.190 | 439.296 | ppm |
| Ni | 192.962 | 117.746 | ppm |
| Cu | 109.020 | 73.8114 | ppm |
| Zn | 115.890 | 56.8277 | ppm |
| Pb | 178673 | 1290.52 | ppm |
| Cd | 457.805 | 98.8246 | ppm |
| Sn | 288.060 | 65.3836 | ppm |
| Sb | 205.320 | 47.0296 | ppm |
| Ba | 125.209 | 19.4091 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 10:54:20
ID: <RESCK>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 504.120 | 119.298 | ppm |
| Ca | 289.345 | 56.1948 | ppm |
| Fe | 699807 | 3718.38 | ppm |
| Ni | 1482.58 | 444.915 | ppm |
| Sb | 49.2637 | 47.2656 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 11:09:49
ID: <4328>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 312.871 | 208.585 | ppm |
| K | 19089.5 | 625.207 | ppm |
| Ca | 2375.01 | 200.300 | ppm |
| Ti | 4902.73 | 231.718 | ppm |
| CrLO | -98.0763 | 108.940 | ppm |
| Mn | 1399.03 | 258.356 | ppm |
| Fe | 26269.4 | 528.905 | ppm |
| Co | 146.111 | 181.478 | ppm |
| Ni | -87.4381 | 46.0996 | ppm |
| Cu | 23.1863 | 31.4017 | ppm |
| Zn | 37.3715 | 25.8580 | ppm |
| As | 4.90203 | 17.7447 | ppm |
| Se | 11.9231 | 12.5671 | ppm |
| Sr | 54.7471 | 5.61523 | ppm |
| Zr | 407.163 | 11.2672 | ppm |
| Mo | 2.79993 | 3.58554 | ppm |
| Hg | 11.0954 | 22.3851 | ppm |
| Pb | 13.3400 | 11.0410 | ppm |
| Rb | 77.6911 | 7.63207 | ppm |
| Cd | 177.680 | 54.3093 | ppm |
| Sn | 0.349072 | 28.9881 | ppm |
| Sb | -35.0978 | 18.7021 | ppm |
| Ba | 252.719 | 12.3917 | ppm |

NL1 002 1260

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 11:12:40
ID: <4330>
( ) (' )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 102.977 | 232.153 | ppm |
| K | 9712.40 | 493.991 | ppm |
| Ca | 36090.2 | 564.593 | ppm |
| Ti | 1099.67 | 134.666 | ppm |
| CrLO | 78.3035 | 98.5763 | ppm |
| Mn | 1841.19 | 369.750 | ppm |
| Fe | 154954 | 1404.09 | ppm |
| Co | -290.809 | 439.768 | ppm |
| Ni | 350.050 | 121.936 | ppm |
| Cu | 53.9072 | 48.5419 | ppm |
| Zn | 278.147 | 46.8840 | ppm |
| As | 92.3774 | 39.0242 | ppm |
| Se | -64.8338 | 13.7852 | ppm |
| Sr | 61.9675 | 8.49681 | ppm |
| Zr | 98.4634 | 8.34938 | ppm |
| Mo | -5.46122 | 3.31253 | ppm |
| Hg | 59.4314 | 36.9966 | ppm |
| Pb | 171.941 | 26.6684 | ppm |
| Rb | 61.0559 | 10.4426 | ppm |
| Cd | 133.407 | 81.3889 | ppm |
| Sn | -1.34287 | 43.7984 | ppm |
| Sb | 20.5157 | 29.1201 | ppm |
| Ba | 77.1929 | 11.1255 | ppm |

NLI 002 1261

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 11:16:39
ID: <4500>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 95.8405 | 206.475 | ppm |
| K | 31264.7 | 793.702 | ppm |
| Ca | 3825.89 | 255.282 | ppm |
| Ti | 5341.80 | 251.936 | ppm |
| CrLO | -35.1280 | 121.491 | ppm |
| Mn | 923.268 | 256.803 | ppm |
| Fe | 39185.4 | 666.841 | ppm |
| Co | -148.500 | 215.947 | ppm |
| Ni | -2.12849 | 56.9013 | ppm |
| Cu | 67.1927 | 36.6095 | ppm |
| Zn | 85.8478 | 29.4959 | ppm |
| As | -239.449 | 70.0618 | ppm |
| Se | 3.53192 | 14.4570 | ppm |
| Sr | 58.7963 | 6.41134 | ppm |
| Zr | 403.717 | 12.1402 | ppm |
| Mo | -1.22626 | 3.76493 | ppm |
| Hg | -8.30445 | 24.3435 | ppm |
| Pb | 1879.92 | 55.5348 | ppm |
| Rb | 121.900 | 9.98344 | ppm |
| Cd | 169.254 | 61.7834 | ppm |
| Sn | 9.02176 | 33.3688 | ppm |
| Sb | 26.6254 | 22.7399 | ppm |
| Ba | 474.584 | 17.4960 | ppm |

NLI 002 1262

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 11:20:44
ID: <4500-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 212.668 | 217.797 | ppm |
| K | 31046.0 | 791.084 | ppm |
| Ca | 4443.06 | 265.581 | ppm |
| Ti | 5473.43 | 248.765 | ppm |
| CrLO | -365.606 | 105.655 | ppm |
| Mn | 575.135 | 243.087 | ppm |
| Fe | 39642.4 | 671.186 | ppm |
| Co | 226.151 | 224.680 | ppm |
| Ni | 95.9124 | 64.6597 | ppm |
| Cu | -4.09851 | 32.6827 | ppm |
| Zn | 85.2623 | 29.4906 | ppm |
| As | -315.363 | 68.6678 | ppm |
| Se | -37.1290 | 12.4911 | ppm |
| Sr | 49.0129 | 6.03510 | ppm |
| Zr | 397.844 | 12.0535 | ppm |
| Mo | -1.54886 | 3.74156 | ppm |
| Hg | 5.74356 | 25.0684 | ppm |
| Pb | 1847.61 | 55.0801 | ppm |
| Rb | 126.477 | 10.1365 | ppm |
| Cd | 99.9146 | 60.7735 | ppm |
| Sn | 29.5393 | 33.6333 | ppm |
| Sb | 60.9136 | 23.1445 | ppm |
| Ba | 424.238 | 16.6512 | ppm |

NLI 002 1263

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 11:24:39
ID: <4497>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 784.924 | 251.908 | ppm |
| K | 20784.4 | 674.333 | ppm |
| Ca | 14792.8 | 398.677 | ppm |
| Ti | 3713.85 | 225.058 | ppm |
| CrLO | -51.2767 | 120.355 | ppm |
| Mn | 382.582 | 235.894 | ppm |
| Fe | 31473.3 | 600.867 | ppm |
| Co | 325.321 | 209.795 | ppm |
| Ni | 3.46358 | 63.0272 | ppm |
| Cu | 45.3162 | 38.9648 | ppm |
| Zn | 131.029 | 34.1636 | ppm |
| As | -1464.95 | 167.365 | ppm |
| Se | -40.5524 | 19.2775 | ppm |
| Sr | 142.227 | 10.2590 | ppm |
| Zr | 299.012 | 11.6756 | ppm |
| Mo | 1.02682 | 3.94324 | ppm |
| Hg | -72.9206 | 29.4132 | ppm |
| Pb | 11601.9 | 145.820 | ppm |
| Rb | 92.3579 | 10.7165 | ppm |
| Cd | -60.3291 | 59.1371 | ppm |
| Sn | 17.1127 | 33.8753 | ppm |
| Sb | 97.2198 | 23.6799 | ppm |
| Ba | 252.667 | 14.0687 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 11:50:02
ID: <E1>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4145.60 | 329.076 | ppm |
| Ca | 5626.18 | 235.934 | ppm |
| Ti | 1240.55 | 130.858 | ppm |
| CrLO | 113.745 | 102.255 | ppm |
| Fe | 9269.14 | 307.308 | ppm |
| Ni | 58.0087 | 48.2673 | ppm |
| Cu | 78.5451 | 33.1804 | ppm |
| Zn | 80.8192 | 27.3574 | ppm |
| Sr | 16.0536 | 3.91308 | ppm |
| Zr | 176.879 | 7.15470 | ppm |
| Mo | 3.36679 | 2.76643 | ppm |
| Pb | 2749.49 | 57.9835 | ppm |
| Rb | 9.76762 | 4.93994 | ppm |
| Sn | 25.2147 | 24.1204 | ppm |
| Sb | 64.7458 | 16.5064 | ppm |
| Ba | 42.4342 | 6.25231 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 11:54:20
ID: <E1 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3791.85 | 327.043 | ppm |
| Ca | 9711.48 | 301.302 | ppm |
| Ti | 1309.76 | 140.060 | ppm |
| CrLO | 243.865 | 113.875 | ppm |
| Mn | 247.245 | 167.180 | ppm |
| Fe | 8215.59 | 291.626 | ppm |
| Ni | 64.7672 | 48.7249 | ppm |
| Cu | 43.6127 | 30.9886 | ppm |
| Zn | 104.117 | 27.5535 | ppm |
| Sr | 25.8556 | 4.41827 | ppm |
| Zr | 152.020 | 6.77594 | ppm |
| Pb | 3333.24 | 64.1265 | ppm |
| Rb | 12.4289 | 5.17638 | ppm |
| Sb | 70.8814 | 14.9280 | ppm |
| Ba | 31.1846 | 5.46326 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 11:59:08
ID: <E2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3083.37 | 288.235 | ppm |
| Ca | 2085.82 | 155.132 | ppm |
| Ti | 923.491 | 126.408 | ppm |
| Fe | 7010.19 | 265.913 | ppm |
| Co | 172.388 | 108.512 | ppm |
| Zn | 64.4660 | 24.8190 | ppm |
| As | 101.721 | 50.7974 | ppm |
| Sr | 10.1556 | 3.17917 | ppm |
| Zr | 258.666 | 8.15268 | ppm |
| Pb | 1152.01 | 36.8979 | ppm |
| Rb | 10.0448 | 4.33633 | ppm |
| Sn | 52.8157 | 25.6798 | ppm |
| Sb | 33.3296 | 16.6877 | ppm |
| Ba | 52.8761 | 6.69184 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:02:54
ID: <E2 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3515.49 | 300.963 | ppm |
| Ca | 1425.54 | 136.870 | ppm |
| Ti | 1285.00 | 133.746 | ppm |
| Fe | 6824.29 | 262.735 | ppm |
| Zn | 51.8635 | 24.4827 | ppm |
| Sr | 15.1656 | 3.50267 | ppm |
| Zr | 278.895 | 8.45273 | ppm |
| Pb | 1279.81 | 38.7110 | ppm |
| Rb | 17.2309 | 4.71964 | ppm |
| Sn | 55.7172 | 25.9778 | ppm |
| Sb | 47.4580 | 16.8632 | ppm |
| Ba | 59.0698 | 6.91610 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:07:52
ID: <E3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4425.58 | 331.646 | ppm |
| Ca | 3022.71 | 181.988 | ppm |
| Ti | 1502.40 | 140.493 | ppm |
| Mn | 226.229 | 165.611 | ppm |
| Fe | 8217.05 | 287.301 | ppm |
| Zn | 68.2674 | 24.6562 | ppm |
| As | 57.3592 | 37.5339 | ppm |
| Sr | 23.7482 | 3.81425 | ppm |
| Zr | 299.457 | 8.76095 | ppm |
| Pb | 573.090 | 26.6941 | ppm |
| Rb | 20.9106 | 4.73265 | ppm |
| Sb | 36.7051 | 16.4883 | ppm |
| Ba | 70.5780 | 7.18960 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:11:36
ID: <E3 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4845.79 | 344.344 | ppm |
| Ca | 3763.85 | 199.383 | ppm |
| Ti | 1141.20 | 127.477 | ppm |
| Fe | 7861.98 | 281.360 | ppm |
| Zn | 85.0215 | 25.1002 | ppm |
| As | 75.7583 | 40.3795 | ppm |
| Sr | 17.7620 | 3.52897 | ppm |
| Zr | 234.204 | 7.78404 | ppm |
| Pb | 677.540 | 28.8287 | ppm |
| Rb | 10.7548 | 4.22728 | ppm |
| Sb | 28.3438 | 15.3551 | ppm |
| Ba | 75.0622 | 7.16891 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:25:49
ID: <E5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4396.19 | 343.069 | ppm |
| Ca | 9765.21 | 301.145 | ppm |
| Ti | 1305.45 | 133.488 | ppm |
| CrLO | 287.007 | 99.4504 | ppm |
| Mn | 266.495 | 163.229 | ppm |
| Fe | 8065.90 | 286.545 | ppm |
| Zn | 224.681 | 30.5266 | ppm |
| As | 40.3773 | 37.4511 | ppm |
| Sr | 30.1282 | 4.14709 | ppm |
| Zr | 206.458 | 7.41771 | ppm |
| Hg | 24.3385 | 20.5221 | ppm |
| Pb | 574.016 | 26.9135 | ppm |
| Rb | 11.6385 | 4.28835 | ppm |
| Sn | 26.9401 | 22.4547 | ppm |
| Sb | 54.2484 | 14.9670 | ppm |
| Ba | 51.5492 | 6.26731 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:29:38
ID: <E5 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2800.78 | 287.663 | ppm |
| Ca | 6144.49 | 241.593 | ppm |
| Ti | 1287.98 | 122.430 | ppm |
| CrLO | 163.185 | 84.9141 | ppm |
| Mn | 406.983 | 161.107 | ppm |
| Fe | 6695.18 | 259.685 | ppm |
| Zn | 163.607 | 26.6882 | ppm |
| As | 51.4205 | 33.6677 | ppm |
| Sr | 19.7621 | 3.49380 | ppm |
| Zr | 158.206 | 6.40494 | ppm |
| Mo | 4.77430 | 2.44741 | ppm |
| Pb | 460.661 | 23.9194 | ppm |
| Rb | 9.13136 | 3.93247 | ppm |
| Sn | 25.8404 | 20.4435 | ppm |
| Ba | 41.9768 | 5.63925 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:35:30
ID: <4328-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -101.352 | 172.199 | ppm |
| K | 19475.0 | 630.845 | ppm |
| Ca | 2083.90 | 194.478 | ppm |
| Ti | 5133.37 | 230.758 | ppm |
| CrLO | -57.9252 | 107.133 | ppm |
| Mn | 1448.59 | 255.771 | ppm |
| Fe | 25430.9 | 519.473 | ppm |
| Co | -86.7408 | 173.160 | ppm |
| Ni | 79.0220 | 54.8842 | ppm |
| Cu | 8.38939 | 30.6390 | ppm |
| Zn | 107.104 | 28.8644 | ppm |
| As | 21.0051 | 17.3950 | ppm |
| Se | -14.9334 | 11.1463 | ppm |
| Sr | 47.1716 | 5.29264 | ppm |
| Zr | 434.119 | 11.5662 | ppm |
| Mo | -4.43242 | 3.43707 | ppm |
| Hg | 21.5606 | 22.7836 | ppm |
| Pb | 2.89076 | 9.99831 | ppm |
| Rb | 76.4309 | 7.54644 | ppm |
| Cd | 11.4136 | 51.3891 | ppm |
| Sn | -8.35869 | 28.4029 | ppm |
| Sb | 54.0094 | 19.6960 | ppm |
| Ba | 239.460 | 12.0552 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:40:01
ID: <4500-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 239.532 | 208.788 | ppm |
| K | 32407.2 | 807.336 | ppm |
| Ca | 3601.78 | 253.301 | ppm |
| Ti | 5419.72 | 249.410 | ppm |
| CrLO | -223.338 | 111.894 | ppm |
| Mn | 613.467 | 241.904 | ppm |
| Fe | 39190.5 | 667.802 | ppm |
| Co | -67.5441 | 217.733 | ppm |
| Ni | 111.304 | 63.9295 | ppm |
| Cu | -23.4281 | 31.3614 | ppm |
| Zn | 146.982 | 32.2436 | ppm |
| As | -234.062 | 70.1810 | ppm |
| Se | -55.3114 | 11.5141 | ppm |
| Sr | 55.9722 | 6.30989 | ppm |
| Zr | 388.907 | 11.9265 | ppm |
| Mo | -7.49168 | 3.51801 | ppm |
| Hg | -1.07395 | 24.6969 | ppm |
| Pb | 1883.56 | 55.5111 | ppm |
| Rb | 126.914 | 10.1430 | ppm |
| Cd | -12.2349 | 60.0397 | ppm |
| Sn | 92.6523 | 35.0063 | ppm |
| Sb | 43.1639 | 22.5231 | ppm |
| Ba | 469.189 | 17.4282 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:49:46
ID: <E6>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4308.27 | 325.357 | ppm |
| Ca | 1370.79 | 137.359 | ppm |
| Ti | 1963.45 | 150.022 | ppm |
| Fe | 8506.92 | 291.374 | ppm |
| Zn | 41.7557 | 23.1628 | ppm |
| Sr | 22.9787 | 3.71906 | ppm |
| Zr | 291.324 | 8.59872 | ppm |
| Pb | 394.997 | 22.6500 | ppm |
| Rb | 23.2504 | 4.76812 | ppm |
| Sn | 70.3860 | 26.1876 | ppm |
| Sb | 19.6984 | 16.3826 | ppm |
| Ba | 76.5292 | 7.41522 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:52:02
ID: <E6 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4908.91 | 342.811 | ppm |
| Ca | 1342.33 | 138.197 | ppm |
| Ti | 2025.21 | 152.974 | ppm |
| Fe | 6668.44 | 260.513 | ppm |
| Sr | 23.2817 | 3.75857 | ppm |
| Zr | 271.246 | 8.27592 | ppm |
| Mo | 4.00031 | 2.86203 | ppm |
| Pb | 423.644 | 23.3397 | ppm |
| Rb | 26.2044 | 4.91531 | ppm |
| Sn | 169.400 | 29.1814 | ppm |
| Sb | 45.7769 | 18.1365 | ppm |
| Ba | 83.9215 | 7.83339 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:56:50
ID: <E7>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 568.080 | 219.601 | ppm |
| K | 4109.72 | 331.561 | ppm |
| Ca | 7982.76 | 274.549 | ppm |
| Ti | 1946.78 | 151.404 | ppm |
| Mn | 179.261 | 178.733 | ppm |
| Fe | 7706.48 | 282.807 | ppm |
| Ni | 92.3517 | 50.8740 | ppm |
| Cu | 34.3536 | 31.5515 | ppm |
| Zn | 105.903 | 29.1386 | ppm |
| Sr | 25.7750 | 4.08980 | ppm |
| Zr | 287.243 | 8.71268 | ppm |
| Hg | 38.0195 | 23.3795 | ppm |
| Pb | 639.714 | 28.5831 | ppm |
| Rb | 20.0067 | 4.93669 | ppm |
| Sn | 39.9041 | 29.5017 | ppm |
| Sb | 44.3502 | 19.7693 | ppm |
| Ba | 95.7166 | 8.46032 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:02:13
ID: <E8>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3378.46 | 321.344 | ppm |
| Ca | 13669.3 | 350.307 | ppm |
| Ti | 1543.74 | 138.941 | ppm |
| Mn | 476.741 | 177.285 | ppm |
| Fe | 6804.67 | 266.533 | ppm |
| Zn | 250.403 | 33.0740 | ppm |
| As | 43.1385 | 33.4877 | ppm |
| Sr | 48.1243 | 4.90944 | ppm |
| Zr | 172.076 | 6.86551 | ppm |
| Pb | 411.319 | 23.3643 | ppm |
| Rb | 11.2630 | 4.37204 | ppm |
| Sn | 41.5521 | 21.8958 | ppm |
| Sb | 67.1576 | 14.7454 | ppm |
| Ba | 48.3332 | 6.03851 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:07:20
ID: <E9>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3026.15 | 287.375 | ppm |
| Ca | 2587.56 | 167.975 | ppm |
| Ti | 980.925 | 114.029 | ppm |
| CrLO | 150.319 | 81.3176 | ppm |
| Mn | 445.155 | 169.054 | ppm |
| Fe | 6366.60 | 253.421 | ppm |
| Zn | 87.8773 | 23.9950 | ppm |
| Sr | 21.4400 | 3.65686 | ppm |
| Zr | 199.897 | 7.16274 | ppm |
| Pb | 885.294 | 32.2645 | ppm |
| Rb | 22.8000 | 4.75075 | ppm |
| Sb | 35.7642 | 14.4147 | ppm |
| Ba | 47.4028 | 6.02096 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:13:00
ID: <E10>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4974.75 | 343.925 | ppm |
| Ca | 1107.30 | 130.628 | ppm |
| Ti | 1807.13 | 144.533 | ppm |
| Fe | 8885.66 | 297.790 | ppm |
| Zn | 54.4511 | 23.9499 | ppm |
| Sr | 35.9670 | 4.32871 | ppm |
| Zr | 404.250 | 10.1326 | ppm |
| Mo | 5.19854 | 3.25826 | ppm |
| Pb | 324.041 | 20.9015 | ppm |
| Rb | 29.7582 | 5.08255 | ppm |
| Cd | 70.4532 | 47.5700 | ppm |
| Sb | 57.9875 | 18.3798 | ppm |
| Ba | 96.5818 | 8.10274 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:19:58
ID: <E11>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4592.28 | 336.221 | ppm |
| Ca | 2932.98 | 180.099 | ppm |
| Ti | 1732.30 | 144.082 | ppm |
| CrLO | 93.3877 | 87.5431 | ppm |
| Fe | 7986.84 | 282.677 | ppm |
| Zn | 124.524 | 26.2788 | ppm |
| Sr | 33.9598 | 4.18946 | ppm |
| Zr | 323.533 | 9.02912 | ppm |
| Pb | 194.753 | 16.7569 | ppm |
| Rb | 24.0302 | 4.72776 | ppm |
| Sn | 28.4087 | 24.3468 | ppm |
| Sb | 22.8669 | 15.3739 | ppm |
| Ba | 94.5747 | 7.74536 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:25:00
ID: <E12>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 5069.95 | 365.258 | ppm |
| Ca | 12147.9 | 334.340 | ppm |
| Ti | 1325.90 | 135.344 | ppm |
| Mn | 682.270 | 200.153 | ppm |
| Fe | 8551.16 | 298.303 | ppm |
| Zn | 108.466 | 28.9050 | ppm |
| Sr | 42.1654 | 4.81783 | ppm |
| Zr | 372.380 | 10.0094 | ppm |
| Mo | 4.96914 | 3.34119 | ppm |
| Pb | 901.941 | 33.7678 | ppm |
| Rb | 27.6299 | 5.36914 | ppm |
| Sn | 80.8045 | 26.4998 | ppm |
| Sb | 52.1477 | 17.5420 | ppm |
| Ba | 78.0151 | 7.54682 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:30:43
ID: <E13>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3633.77 | 309.485 | ppm |
| Ca | 3549.44 | 192.150 | ppm |
| Ti | 1510.30 | 125.165 | ppm |
| CrLO | 70.6447 | 68.2380 | ppm |
| Fe | 5304.20 | 234.413 | ppm |
| Co | 110.058 | 98.6436 | ppm |
| Sr | 25.6421 | 3.86185 | ppm |
| Zr | 536.066 | 11.4813 | ppm |
| Pb | 383.403 | 22.1750 | ppm |
| Rb | 12.9844 | 4.26675 | ppm |
| Cd | 86.1818 | 49.4231 | ppm |
| Sn | 230.373 | 30.3064 | ppm |
| Sb | 50.9267 | 18.8879 | ppm |
| Ba | 82.6339 | 7.85462 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:34:37
ID: <E13 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2206.08 | 260.318 | ppm |
| Ca | 3062.86 | 177.799 | ppm |
| Ti | 1042.23 | 115.843 | ppm |
| Mn | 202.197 | 170.606 | ppm |
| Fe | 5504.93 | 237.377 | ppm |
| Co | 120.288 | 99.3587 | ppm |
| Ni | 113.595 | 48.6090 | ppm |
| Sr | 35.5325 | 4.29166 | ppm |
| Zr | 514.284 | 11.2470 | ppm |
| Hg | 40.3855 | 21.2178 | ppm |
| Pb | 443.185 | 23.4605 | ppm |
| Rb | 15.7824 | 4.40165 | ppm |
| Sn | 198.427 | 29.2634 | ppm |
| Sb | 86.5992 | 18.8661 | ppm |
| Ba | 104.886 | 8.32094 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:40:11
ID: <4328-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -46.4179 | 177.313 | ppm |
| K | 19265.0 | 627.790 | ppm |
| Ca | 2187.44 | 196.484 | ppm |
| Ti | 5050.68 | 233.238 | ppm |
| CrLO | -26.7146 | 110.536 | ppm |
| Mn | 1766.76 | 267.596 | ppm |
| Fe | 25038.0 | 515.674 | ppm |
| Co | -258.843 | 167.802 | ppm |
| Ni | 71.4076 | 53.4432 | ppm |
| Cu | 25.3990 | 31.4461 | ppm |
| Zn | 77.0158 | 27.3855 | ppm |
| As | 25.9107 | 17.4833 | ppm |
| Se | -20.9049 | 10.7704 | ppm |
| Sr | 44.1519 | 5.15365 | ppm |
| Zr | 371.474 | 10.6950 | ppm |
| Mo | 2.03889 | 3.43221 | ppm |
| Hg | 18.4907 | 22.4795 | ppm |
| Pb | 3.14142 | 9.90282 | ppm |
| Rb | 84.8906 | 7.82275 | ppm |
| Cd | 79.7779 | 52.2513 | ppm |
| Sn | 66.2482 | 29.6513 | ppm |
| Sb | 27.3457 | 19.4037 | ppm |
| Ba | 215.124 | 11.5560 | ppm |

NLI 002 1276

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:47:26
ID: <4500-4>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 30437.3 | 783.301 ppm |
| Ca | 3705.32 | 251.210 ppm |
| Ti | 5330.78 | 244.426 ppm |
| Mn | 1392.11 | 273.939 ppm |
| Fe | 38152.9 | 656.562 ppm |
| Ni | 109.690 | 64.0572 ppm |
| Zn | 75.9425 | 28.8733 ppm |
| Sr | 66.4976 | 6.67105 ppm |
| Zr | 390.211 | 11.9128 ppm |
| Mo | 4.45469 | 3.88004 ppm |
| Pb | 1799.46 | 54.1632 ppm |
| Rb | 101.776 | 9.30529 ppm |
| Sn | 94.6225 | 34.3170 ppm |
| Sb | 49.8244 | 22.4401 ppm |
| Ba | 432.560 | 16.6978 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:51:52
ID: <E14>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 7602.09 | 416.494 ppm |
| Ca | 5321.35 | 235.591 ppm |
| Ti | 2039.43 | 157.582 ppm |
| Mn | 921.750 | 213.508 ppm |
| Fe | 9263.33 | 309.175 ppm |
| Ni | 67.6250 | 49.2112 ppm |
| Zn | 146.745 | 30.5038 ppm |
| Sr | 39.1886 | 4.61518 ppm |
| Zr | 342.431 | 9.51845 ppm |
| Pb | 264.646 | 19.7607 ppm |
| Rb | 32.5973 | 5.42762 ppm |
| Sb | 59.3423 | 18.2164 ppm |
| Ba | 110.916 | 8.57883 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 13:56:19
ID: <E15>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4191.24 | 327.382 | ppm |
| Ca | 4442.89 | 212.047 | ppm |
| Ti | 1307.19 | 129.619 | ppm |
| Fe | 5079.06 | 227.582 | ppm |
| Zn | 56.9504 | 22.0637 | ppm |
| As | 33.3988 | 23.1516 | ppm |
| Sr | 23.9821 | 3.64918 | ppm |
| Zr | 191.171 | 6.90801 | ppm |
| Hg | 18.8570 | 18.4424 | ppm |
| Pb | 170.805 | 15.5835 | ppm |
| Rb | 6.60480 | 3.66319 | ppm |
| Sn | 21.3027 | 19.8507 | ppm |
| Ba | 40.8249 | 5.50898 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:04:48
ID: <4328-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 6.20693 | 180.461 | ppm |
| K | 19275.2 | 627.608 | ppm |
| Ca | 1909.88 | 189.872 | ppm |
| Ti | 4631.90 | 224.827 | ppm |
| CrLO | -266.673 | 99.3348 | ppm |
| Mn | 1918.99 | 274.124 | ppm |
| Fe | 24279.9 | 507.308 | ppm |
| Co | -29.2726 | 171.108 | ppm |
| Ni | 101.261 | 55.9771 | ppm |
| Cu | -11.2408 | 29.1997 | ppm |
| Zn | 165.302 | 31.0076 | ppm |
| As | -4.61158 | 17.5643 | ppm |
| Se | -17.9283 | 10.8750 | ppm |
| Sr | 51.6482 | 5.44080 | ppm |
| Zr | 429.363 | 11.4765 | ppm |
| Mo | 3.45861 | 3.62494 | ppm |
| Hg | 5.66029 | 21.6554 | ppm |
| Pb | 24.0079 | 11.2100 | ppm |
| Rb | 80.4275 | 7.65307 | ppm |
| Cd | 1.96759 | 50.0979 | ppm |
| Sn | 20.3767 | 28.2308 | ppm |
| Sb | 12.0501 | 18.2978 | ppm |
| Ba | 222.335 | 11.6086 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:09:52
ID: <4500-5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 31828.4 | 800.105 | ppm |
| Ca | 3688.41 | 253.604 | ppm |
| Ti | 5468.30 | 246.609 | ppm |
| Mn | 423.667 | 228.807 | ppm |
| Fe | 38097.6 | 656.592 | ppm |
| Ni | 176.859 | 67.2957 | ppm |
| Zn | 99.9738 | 29.9825 | ppm |
| Sr | 49.2258 | 5.99436 | ppm |
| Zr | 364.146 | 11.4678 | ppm |
| Hg | 27.4605 | 25.9292 | ppm |
| Pb | 1698.53 | 52.5216 | ppm |
| Rb | 143.115 | 10.5361 | ppm |
| Sb | 26.5863 | 21.9507 | ppm |
| Ba | 455.051 | 17.0627 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:29:55
ID: <W1>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4870.61 | 342.249 | ppm |
| Ca | 667.489 | 115.825 | ppm |
| Ti | 1166.04 | 137.440 | ppm |
| Fe | 14738.7 | 386.143 | ppm |
| Sr | 28.5362 | 4.96678 | ppm |
| Zr | 77.0483 | 5.42667 | ppm |
| Mo | 3.58725 | 2.84309 | ppm |
| Pb | 4177.05 | 73.7080 | ppm |
| Rb | 27.5677 | 6.44061 | ppm |
| Sn | 232.057 | 31.2882 | ppm |
| Sb | 131.822 | 20.6611 | ppm |
| Ba | 47.1007 | 7.05040 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:35:04
ID: <W2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 1601.34 | 231.719 | ppm |
| Ca | 2238.20 | 154.937 | ppm |
| Ti | 96.5607 | 79.4746 | ppm |
| CrLO | 270.582 | 96.2529 | ppm |
| Fe | 2924.39 | 177.966 | ppm |
| Ni | 73.9060 | 44.5069 | ppm |
| Zn | 221.037 | 30.7630 | ppm |
| Sr | 6.81357 | 2.88974 | ppm |
| Zr | 17.2896 | 2.72682 | ppm |
| Mo | 2.09871 | 1.92682 | ppm |
| Pb | 853.242 | 31.0999 | ppm |
| Ba | 17.3365 | 4.21080 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:39:51
ID: <W3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 409.088 | 173.045 | ppm |
| K | 3325.05 | 309.506 | ppm |
| Ca | 8708.17 | 284.914 | ppm |
| Ti | 496.510 | 105.085 | ppm |
| CrLO | 499.060 | 115.663 | ppm |
| Mn | 161.872 | 151.021 | ppm |
| Fe | 5919.38 | 247.025 | ppm |
| Ni | 51.3986 | 43.7432 | ppm |
| Cu | 63.1767 | 28.9179 | ppm |
| Zn | 239.460 | 29.8741 | ppm |
| As | 245.687 | 68.6177 | ppm |
| Sr | 13.9826 | 3.52471 | ppm |
| Zr | 90.4440 | 5.18358 | ppm |
| Mo | 2.31796 | 2.20219 | ppm |
| Pb | 2145.01 | 50.5034 | ppm |
| Sb | 37.4925 | 11.7508 | ppm |
| Ba | 22.4713 | 4.53072 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:44:40
ID: <W4>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| CrHI | 221.331 | 181.105 ppm |
| K | 3489.58 | 308.632 ppm |
| Ca | 6063.54 | 241.771 ppm |
| Ti | 638.125 | 106.422 ppm |
| Fe | 5332.52 | 236.185 ppm |
| Zn | 218.454 | 31.9370 ppm |
| Sr | 20.9312 | 3.84078 ppm |
| Zr | 140.833 | 6.22631 ppm |
| Pb | 1571.29 | 42.8866 ppm |
| Rb | 7.81351 | 4.42836 ppm |
| Sb | 50.9348 | 14.3781 ppm |
| Ba | 36.4757 | 5.59642 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:49:12
ID: <W5>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 4361.20 | 339.519 ppm |
| Ca | 8631.04 | 284.940 ppm |
| Ti | 822.906 | 128.912 ppm |
| Mn | 187.330 | 163.694 ppm |
| Fe | 8550.17 | 295.282 ppm |
| Ni | 50.1719 | 46.6040 ppm |
| Zn | 105.457 | 28.0974 ppm |
| Sr | 21.3231 | 3.88843 ppm |
| Zr | 214.594 | 7.62508 ppm |
| Pb | 1210.87 | 38.4201 ppm |
| Rb | 7.89289 | 4.41587 ppm |
| Sn | 22.1613 | 22.0525 ppm |
| Sb | 40.0330 | 14.7235 ppm |
| Ba | 56.4149 | 6.41459 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:53:57
ID: <W6>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 6113.71 | 377.737 | ppm |
| Ca | 2671.15 | 177.928 | ppm |
| Ti | 2681.26 | 172.372 | ppm |
| Fe | 10084.8 | 319.651 | ppm |
| Zn | 90.2587 | 27.7436 | ppm |
| Sr | 20.4565 | 3.82698 | ppm |
| Zr | 365.799 | 9.82324 | ppm |
| Pb | 925.892 | 34.0322 | ppm |
| Rb | 24.0348 | 5.15484 | ppm |
| Sn | 136.884 | 29.1036 | ppm |
| Sb | 53.0863 | 18.5180 | ppm |
| Ba | 89.1901 | 8.09160 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 15:58:30
ID: <W7>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4138.76 | 342.488 | ppm |
| Ca | 13360.3 | 348.625 | ppm |
| Ti | 893.388 | 123.416 | ppm |
| Mn | 553.880 | 182.455 | ppm |
| Fe | 6856.25 | 268.236 | ppm |
| Co | 115.252 | 108.501 | ppm |
| Zn | 193.518 | 30.6355 | ppm |
| Sr | 20.7440 | 3.95095 | ppm |
| Zr | 189.732 | 7.28272 | ppm |
| Pb | 1775.87 | 46.5091 | ppm |
| Rb | 14.5105 | 4.85872 | ppm |
| Sn | 68.5600 | 22.6378 | ppm |
| Sb | 58.2642 | 14.8931 | ppm |
| Ba | 42.9856 | 5.92490 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:03:51
ID: <W8>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 6067.69 | 383.025 | ppm |
| Ca | 6631.60 | 256.675 | ppm |
| Ti | 1566.01 | 144.101 | ppm |
| Fe | 8218.97 | 290.558 | ppm |
| Zn | 55.0422 | 25.1664 | ppm |
| Sr | 30.9647 | 4.44034 | ppm |
| Zr | 250.956 | 8.31432 | ppm |
| Pb | 2048.24 | 49.7877 | ppm |
| Rb | 9.41377 | 4.66604 | ppm |
| Sn | 83.8782 | 24.9879 | ppm |
| Sb | 68.9295 | 16.4992 | ppm |
| Ba | 62.9093 | 6.90279 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:09:01
ID: <W8 1">
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3605.85 | 303.854 | ppm |
| Ca | 1772.24 | 146.932 | ppm |
| Ti | 988.250 | 106.697 | ppm |
| CrLO | 219.452 | 84.8678 | ppm |
| Fe | 4706.99 | 218.584 | ppm |
| Zn | 115.907 | 23.3906 | ppm |
| As | 59.9122 | 39.6948 | ppm |
| Sr | 7.52586 | 2.76046 | ppm |
| Zr | 183.974 | 6.75339 | ppm |
| Pb | 713.436 | 28.7485 | ppm |
| Rb | 9.76488 | 3.88721 | ppm |
| Sb | 43.4885 | 13.4251 | ppm |
| Ba | 51.7120 | 5.99576 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:13:07
ID: <W8 1" REP>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3015.25 | 284.495 ppm |
| Ca | 1776.51 | 145.547 ppm |
| Ti | 915.887 | 107.578 ppm |
| CrLO | 136.313 | 83.0718 ppm |
| Fe | 4424.42 | 212.200 ppm |
| Zn | 106.132 | 22.7983 ppm |
| As | 86.9034 | 39.7170 ppm |
| Sr | 9.05615 | 2.82277 ppm |
| Zr | 187.894 | 6.80549 ppm |
| Pb | 701.382 | 28.4840 ppm |
| Sb | 50.3802 | 13.1803 ppm |
| Ba | 61.7701 | 6.30339 ppm |

NLI 002 1285

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:19:58
ID: <4328-5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 31.4021 | 183.851 | ppm |
| K | 18252.3 | 611.734 | ppm |
| Ca | 1826.44 | 185.582 | ppm |
| Ti | 4319.44 | 221.215 | ppm |
| CrLO | -59.5888 | 107.675 | ppm |
| Mn | 1685.30 | 264.286 | ppm |
| Fe | 23460.7 | 497.459 | ppm |
| Co | 131.735 | 171.942 | ppm |
| Ni | 19.0035 | 51.3298 | ppm |
| Cu | -31.0253 | 27.4237 | ppm |
| Zn | 63.2139 | 26.3119 | ppm |
| As | 2.40564 | 16.4064 | ppm |
| Se | -9.66364 | 11.1837 | ppm |
| Sr | 49.8447 | 5.33047 | ppm |
| Zr | 436.576 | 11.5031 | ppm |
| Mo | 2.51975 | 3.59260 | ppm |
| Hg | 6.54283 | 21.4520 | ppm |
| Pb | 4.44363 | 9.95188 | ppm |
| Rb | 55.9167 | 6.69702 | ppm |
| Cd | 135.575 | 51.4532 | ppm |
| Sn | 35.9318 | 28.3363 | ppm |
| Sb | -1.77320 | 18.4657 | ppm |
| Ba | 241.319 | 11.9648 | ppm |

NLI 002 1286

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:26:48
ID: <4500-6>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 261.530 | 212.185 | ppm |
| K | 30723.7 | 786.945 | ppm |
| Ca | 3290.09 | 244.289 | ppm |
| Ti | 5136.17 | 248.106 | ppm |
| Mn | 298.645 | 226.171 | ppm |
| Fe | 38030.1 | 654.868 | ppm |
| Cu | 41.0974 | 35.0317 | ppm |
| Zn | 206.745 | 34.7112 | ppm |
| Sr | 54.0883 | 6.21287 | ppm |
| Zr | 421.460 | 12.3296 | ppm |
| Hg | 33.0006 | 26.4487 | ppm |
| Pb | 1845.10 | 54.7415 | ppm |
| Rb | 132.789 | 10.2548 | ppm |
| Cd | 164.610 | 60.9446 | ppm |
| Ba | 445.079 | 16.9077 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:30:25
ID: <W9>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4830.83 | 365.309 | ppm |
| Ca | 15290.7 | 372.896 | ppm |
| Ti | 1151.30 | 129.958 | ppm |
| Mn | 439.514 | 181.885 | ppm |
| Fe | 8060.41 | 290.834 | ppm |
| Zn | 144.068 | 28.6377 | ppm |
| Sr | 23.8885 | 4.21219 | ppm |
| Zr | 215.429 | 7.85702 | ppm |
| Pb | 2390.69 | 54.4074 | ppm |
| Rb | 11.4382 | 4.90066 | ppm |
| Sb | 67.3207 | 15.7768 | ppm |
| Ba | 46.3268 | 6.26659 | ppm |

NLI 002 1287

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:35:04
ID: <W8 10">
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3402.76 | 295.745 | ppm |
| Ca | 542.813 | 104.789 | ppm |
| Ti | 1685.12 | 132.432 | ppm |
| Fe | 5921.83 | 244.072 | ppm |
| Sr | 16.2099 | 3.28030 | ppm |
| Zr | 309.070 | 8.64720 | ppm |
| Pb | 98.2532 | 13.1407 | ppm |
| Rb | 21.0188 | 4.46179 | ppm |
| Sn | 186.556 | 29.5840 | ppm |
| Sb | 83.8827 | 19.1982 | ppm |
| Ba | 106.398 | 8.40606 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:40:46
ID: <W11>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 1362.80 | 222.939 | ppm |
| Ca | 2589.74 | 164.376 | ppm |
| Ti | 467.812 | 89.5171 | ppm |
| Fe | 4492.04 | 218.057 | ppm |
| Zn | 188.934 | 32.7993 | ppm |
| Sr | 12.4039 | 3.59274 | ppm |
| Zr | 18.1814 | 3.09646 | ppm |
| Pb | 2289.48 | 51.1435 | ppm |
| Sb | 50.0367 | 14.0687 | ppm |
| Ba | 15.5367 | 4.64116 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 16:46:12
ID: <W10>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 4655.09 | 343.186 ppm |
| Ca | 5845.38 | 239.389 ppm |
| Ti | 1485.95 | 123.208 ppm |
| CrLO | 183.895 | 79.6112 ppm |
| Fe | 5263.79 | 232.099 ppm |
| Cu | 29.5274 | 25.6709 ppm |
| Zn | 96.3432 | 23.3205 ppm |
| Sr | 14.8440 | 3.14788 ppm |
| Zr | 229.770 | 7.54032 ppm |
| Mo | 5.92980 | 2.66396 ppm |
| Pb | 148.428 | 14.7133 ppm |
| Rb | 9.69268 | 3.81007 ppm |
| Ba | 66.2479 | 6.65081 ppm |

NLI 002 1289

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 07:29:09
ID: <ECAL>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 2351.34 | 608.013 | ppm |
| K | 1111.84 | 252.002 | ppm |
| Ca | 11813.3 | 312.726 | ppm |
| Ti | -132.463 | 78.5107 | ppm |
| CrLO | 127.968 | 126.858 | ppm |
| Mn | 812.159 | 451.824 | ppm |
| Fe | 766.405 | 259.946 | ppm |
| Co | -36.8994 | 178.588 | ppm |
| Ni | 165.873 | 119.275 | ppm |
| Cu | 3.92738 | 71.7241 | ppm |
| Zn | 37.8198 | 55.5621 | ppm |
| As | -5795.73 | 748.738 | ppm |
| Se | 3.00148 | 85.9091 | ppm |
| Sr | -35.1231 | 37.8397 | ppm |
| Zr | 131.960 | 34.5045 | ppm |
| Mo | -4.91660 | 11.2254 | ppm |
| Hg | -12.3209 | 104.892 | ppm |
| Pb | 185520 | 1346.57 | ppm |
| Rb | -93.9936 | 32.1799 | ppm |
| Cd | 511.566 | 103.435 | ppm |
| Sn | 298.431 | 67.6067 | ppm |
| Sb | 216.435 | 49.1258 | ppm |
| Ba | 118.112 | 19.3608 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 07:44:17
ID: <RESCK>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 24.9555 | 55.9681 | ppm |
| K | -1045.26 | 0.630425 | ppm |
| Ca | -330.656 | 0.204601 | ppm |
| Ti | -84.9248 | 0.0570939 | ppm |
| CrLO | 100.722 | 0.0701622 | ppm |
| Mn | -123.130 | 1091.27 | ppm |
| Fe | 1.56055e+06 | 7400.83 | ppm |
| Co | -7963.97 | 2035.38 | ppm |
| Ni | 2814.11 | 1035.87 | ppm |
| Cu | -495.221 | 192.998 | ppm |
| Zn | 177.812 | 158.859 | ppm |
| As | 223.481 | 134.958 | ppm |
| Se | -115.929 | 54.1790 | ppm |
| Sr | 40.6351 | 24.6300 | ppm |
| Zr | 6.01901 | 14.0250 | ppm |
| Mo | 19.0188 | 12.7761 | ppm |
| Hg | -72.5232 | 155.931 | ppm |
| Pb | -41.2384 | 103.234 | ppm |
| Rb | 8.76125 | 38.8821 | ppm |
| Cd | 48.7793 | 0.233918 | ppm |
| Sn | -302.137 | 1.35194 | ppm |
| Sb | -34.1961 | 0.161988 | ppm |
| Ba | -16.8858 | 0.0789973 | ppm |

NLI 002 1291

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 07:53:07
ID: <4328>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -78.9293 | 181.780 | ppm |
| K | 18406.6 | 614.545 | ppm |
| Ca | 2101.92 | 192.578 | ppm |
| Ti | 4301.67 | 227.064 | ppm |
| CrLO | -13.2094 | 111.516 | ppm |
| Mn | 1598.85 | 260.730 | ppm |
| Fe | 23939.6 | 502.782 | ppm |
| Co | 337.640 | 178.447 | ppm |
| Ni | 28.0462 | 53.1014 | ppm |
| Cu | -33.0214 | 27.6057 | ppm |
| Zn | 81.1355 | 27.3850 | ppm |
| As | 15.2485 | 16.5575 | ppm |
| Se | -26.0673 | 10.4150 | ppm |
| Sr | 39.9155 | 4.93260 | ppm |
| Zr | 384.440 | 10.8148 | ppm |
| Mo | 0.513653 | 3.40475 | ppm |
| Hg | -1.04785 | 21.2343 | ppm |
| Pb | -2.16125 | 9.38119 | ppm |
| Rb | 71.1481 | 7.29269 | ppm |
| Cd | 76.9999 | 51.3483 | ppm |
| Sn | 98.1996 | 29.6828 | ppm |
| Sb | -7.22969 | 18.3053 | ppm |
| Ba | 227.218 | 11.7142 | ppm |

NLI 002 1292

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 07:57:20
ID: <4330>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 305.438 | 243.642 | ppm |
| K | 10276.5 | 505.221 | ppm |
| Ca | 37280.3 | 574.020 | ppm |
| Ti | 714.633 | 134.971 | ppm |
| Mn | 1722.14 | 376.073 | ppm |
| Fe | 167692 | 1475.89 | ppm |
| Ni | 517.081 | 138.971 | ppm |
| Cu | 216.389 | 61.0255 | ppm |
| Zn | 369.305 | 52.4677 | ppm |
| As | 101.249 | 36.7494 | ppm |
| Sr | 62.7680 | 8.69450 | ppm |
| Zr | 93.6995 | 8.40170 | ppm |
| Pb | 108.394 | 24.3986 | ppm |
| Rb | 59.0252 | 10.6498 | ppm |
| Ba | 63.3044 | 10.8820 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 08:01:07
ID: <4500>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 277.719 | 219.198 | ppm |
| K | 31688.4 | 798.706 | ppm |
| Ca | 3532.73 | 250.714 | ppm |
| Ti | 5363.15 | 251.484 | ppm |
| Fe | 37545.7 | 651.858 | ppm |
| Ni | 62.0540 | 61.2736 | ppm |
| Cu | 51.5052 | 35.5824 | ppm |
| Zn | 52.4660 | 27.6661 | ppm |
| Sr | 65.5464 | 6.63186 | ppm |
| Zr | 376.449 | 11.6729 | ppm |
| Pb | 1844.27 | 54.6588 | ppm |
| Rb | 130.849 | 10.1773 | ppm |
| Cd | 106.021 | 61.1863 | ppm |
| Sn | 67.8757 | 34.4488 | ppm |
| Sb | 58.6109 | 23.2362 | ppm |
| Ba | 438.344 | 16.8534 | ppm |

NLI 002 1293

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 08:11:18
ID: <4497>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 21551.5 | 684.038 | ppm |
| Ca | 12664.0 | 374.221 | ppm |
| Ti | 4750.24 | 232.923 | ppm |
| Mn | 789.013 | 251.596 | ppm |
| Fe | 30055.7 | 586.397 | ppm |
| Ni | 110.654 | 66.4249 | ppm |
| Zn | 162.872 | 35.1153 | ppm |
| Sr | 118.928 | 9.56598 | ppm |
| Zr | 384.628 | 12.8937 | ppm |
| Pb | 11402.3 | 143.527 | ppm |
| Rb | 82.6054 | 10.3347 | ppm |
| Sb | 71.9388 | 23.1354 | ppm |
| Ba | 251.737 | 14.0105 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 09:50:10
ID: <E1 6" S>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 336.363 | 195.624 | ppm |
| K | 4635.61 | 338.684 | ppm |
| Ca | 3631.15 | 196.392 | ppm |
| Ti | 1276.09 | 136.359 | ppm |
| CrLO | 147.129 | 98.7790 | ppm |
| Fe | 7471.41 | 275.363 | ppm |
| Ni | 46.0304 | 43.8650 | ppm |
| Cu | 55.2916 | 29.3278 | ppm |
| Zn | 59.3708 | 23.7984 | ppm |
| As | 117.782 | 48.8160 | ppm |
| Sr | 22.3823 | 3.82467 | ppm |
| Zr | 253.114 | 8.13532 | ppm |
| Pb | 1036.32 | 35.2649 | ppm |
| Rb | 20.6383 | 4.80374 | ppm |
| Sb | 49.3770 | 16.3804 | ppm |
| Ba | 63.1455 | 6.93070 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 09:54:21
ID: <E1 6" S REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3190.95 | 298.705 | ppm |
| Ca | 5345.11 | 228.522 | ppm |
| Ti | 649.269 | 118.630 | ppm |
| CrLO | 194.145 | 102.375 | ppm |
| Fe | 7218.85 | 269.938 | ppm |
| Ni | 62.4121 | 43.8733 | ppm |
| Cu | 46.3898 | 27.8460 | ppm |
| Zn | 81.9543 | 23.4709 | ppm |
| Sr | 13.2060 | 3.44340 | ppm |
| Zr | 146.934 | 6.36783 | ppm |
| Pb | 2037.19 | 48.9989 | ppm |
| Sb | 65.5662 | 13.7004 | ppm |
| Ba | 29.5278 | 5.23489 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 09:59:06
ID: <E16>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 223.681 | 192.978 | ppm |
| K | 3718.64 | 311.750 | ppm |
| Ca | 3178.74 | 185.051 | ppm |
| Ti | 1444.61 | 139.107 | ppm |
| CrLO | 171.899 | 103.892 | ppm |
| Fe | 8719.64 | 298.427 | ppm |
| Ni | 56.2995 | 49.0556 | ppm |
| Cu | 59.9773 | 33.1931 | ppm |
| Zn | 134.329 | 30.3757 | ppm |
| Sr | 27.1172 | 4.45033 | ppm |
| Zr | 184.619 | 7.31586 | ppm |
| Pb | 2818.53 | 58.5501 | ppm |
| Rb | 22.9556 | 5.58271 | ppm |
| Sn | 84.5400 | 26.2269 | ppm |
| Sb | 70.2280 | 17.1777 | ppm |
| Ba | 54.1938 | 6.80300 | ppm |

VLI 002 1295

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 10:07:14
ID: <E2 REP 2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4345.34 | 327.213 | ppm |
| Ca | 1843.83 | 151.339 | ppm |
| Ti | 1871.15 | 137.606 | ppm |
| CrLO | 301.439 | 91.4379 | ppm |
| Fe | 7262.01 | 270.153 | ppm |
| Zn | 91.7745 | 24.5704 | ppm |
| Sr | 17.4844 | 3.47139 | ppm |
| Zr | 252.044 | 7.99551 | ppm |
| Mo | 3.98970 | 2.75865 | ppm |
| Hg | 27.1285 | 19.9186 | ppm |
| Pb | 573.103 | 26.4635 | ppm |
| Rb | 19.2491 | 4.55475 | ppm |
| Sb | 50.1010 | 16.1238 | ppm |
| Ba | 76.1149 | 7.21861 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 10:22:02
ID: <E11 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 6550.27 | 388.456 | ppm |
| Ca | 2837.98 | 182.599 | ppm |
| Ti | 3052.41 | 172.044 | ppm |
| CrLO | 303.923 | 99.1206 | ppm |
| Mn | 414.391 | 186.160 | ppm |
| Fe | 8976.32 | 302.466 | ppm |
| Cu | 51.4694 | 30.2450 | ppm |
| Zn | 74.5855 | 25.7175 | ppm |
| Sr | 32.0190 | 4.22159 | ppm |
| Zr | 367.283 | 9.74009 | ppm |
| Pb | 226.596 | 18.2801 | ppm |
| Rb | 25.3483 | 4.94453 | ppm |
| Cd | 54.3535 | 50.8079 | ppm |
| Sn | 35.6488 | 28.4197 | ppm |
| Ba | 120.432 | 8.93451 | ppm |

NLI 002 1296

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 10:31:05
ID: <E17>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4083.76 | 331.356 | ppm |
| Ca | 7868.41 | 273.377 | ppm |
| Ti | 1511.88 | 134.775 | ppm |
| CrLO | 219.673 | 103.051 | ppm |
| Mn | 364.427 | 176.829 | ppm |
| Fe | 7809.16 | 284.114 | ppm |
| Cu | 56.8175 | 31.8889 | ppm |
| Zn | 132.753 | 29.2714 | ppm |
| As | 93.5913 | 66.4010 | ppm |
| Sr | 30.7099 | 4.44878 | ppm |
| Zr | 219.123 | 7.82461 | ppm |
| Mo | 6.79094 | 2.97442 | ppm |
| Pb | 2014.52 | 49.5260 | ppm |
| Rb | 24.9490 | 5.43212 | ppm |
| Sn | 67.6600 | 26.5578 | ppm |
| Sb | 45.4653 | 17.2977 | ppm |
| Ba | 61.9279 | 7.11683 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 10:36:19
ID: <HE16>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2548.52 | 266.153 | ppm |
| Ca | 487.608 | 99.6478 | ppm |
| Ti | 1652.57 | 136.560 | ppm |
| Fe | 5869.85 | 243.624 | ppm |
| Ni | 52.6336 | 44.0305 | ppm |
| Sr | 23.2731 | 3.73095 | ppm |
| Zr | 290.397 | 8.45262 | ppm |
| Hg | 21.0546 | 20.3789 | ppm |
| Pb | 403.380 | 22.5660 | ppm |
| Rb | 20.2369 | 4.59309 | ppm |
| Sn | 141.035 | 27.0828 | ppm |
| Sb | 54.8077 | 17.2778 | ppm |
| Ba | 62.7031 | 6.97718 | ppm |

NLI 002 1297

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 10:40:05
ID: <HE16 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 233.308 | 185.337 | ppm |
| K | 3425.56 | 296.345 | ppm |
| Ca | 774.035 | 113.724 | ppm |
| Ti | 1479.62 | 124.119 | ppm |
| Fe | 6050.98 | 247.970 | ppm |
| Sr | 19.8367 | 3.54421 | ppm |
| Zr | 281.966 | 8.34575 | ppm |
| Pb | 223.407 | 17.7113 | ppm |
| Rb | 27.8161 | 4.90237 | ppm |
| Sn | 176.689 | 27.4795 | ppm |
| Sb | 70.2481 | 17.5736 | ppm |
| Ba | 62.8993 | 6.97095 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 10:45:49
ID: <HE2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2634.00 | 268.653 | ppm |
| Ca | 236.740 | 87.9515 | ppm |
| Ti | 1417.03 | 116.960 | ppm |
| CrLO | 142.160 | 65.9468 | ppm |
| Fe | 5397.99 | 233.893 | ppm |
| Ni | 45.3069 | 42.7858 | ppm |
| Sr | 15.2835 | 3.23443 | ppm |
| Zr | 284.208 | 8.29641 | ppm |
| Pb | 152.147 | 15.1499 | ppm |
| Rb | 18.8233 | 4.38093 | ppm |
| Cd | 84.2009 | 48.8902 | ppm |
| Sn | 163.403 | 29.0718 | ppm |
| Sb | 55.1314 | 18.7637 | ppm |
| Ba | 87.9104 | 7.91022 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 10:49:58
ID: <HE2 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4666.28 | 334.937 | ppm |
| Ca | 1083.30 | 128.921 | ppm |
| Ti | 2236.70 | 147.318 | ppm |
| Fe | 6928.00 | 265.247 | ppm |
| Sr | 27.3025 | 3.92957 | ppm |
| Zr | 296.524 | 8.62784 | ppm |
| Pb | 278.938 | 19.4700 | ppm |
| Rb | 14.2795 | 4.32816 | ppm |
| Cd | 52.8616 | 46.8305 | ppm |
| Sn | 69.2474 | 26.8092 | ppm |
| Ba | 93.6379 | 7.95796 | ppm |

NLI 002 1299

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 10:58:57
ID: <4328-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -229.687 | 175.146 | ppm |
| K | 19467.3 | 630.718 | ppm |
| Ca | 2160.95 | 196.142 | ppm |
| Ti | 4847.50 | 228.270 | ppm |
| CrLO | -227.595 | 101.478 | ppm |
| Mn | 1778.21 | 269.984 | ppm |
| Fe | 25483.1 | 520.163 | ppm |
| Co | 199.975 | 180.374 | ppm |
| Ni | 117.469 | 58.3524 | ppm |
| Cu | -5.01558 | 29.9159 | ppm |
| Zn | 69.9996 | 27.0978 | ppm |
| As | 3.04566 | 17.3011 | ppm |
| Se | -8.29672 | 11.4721 | ppm |
| Sr | 42.0422 | 5.06576 | ppm |
| Zr | 397.605 | 11.0806 | ppm |
| Mo | 0.677843 | 3.47708 | ppm |
| Hg | -7.43907 | 21.0086 | ppm |
| Pb | 12.4502 | 10.6747 | ppm |
| Rb | 72.0223 | 7.39045 | ppm |
| Cd | -32.2467 | 51.0447 | ppm |
| Sn | -10.3722 | 28.4496 | ppm |
| Sb | 32.8338 | 19.1004 | ppm |
| Ba | 237.313 | 11.9991 | ppm |

NLi 002 1300

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 11:01:50
ID: <4500-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 32488.6 | 808.227 | ppm |
| Ca | 3314.56 | 248.336 | ppm |
| Ti | 6123.03 | 258.743 | ppm |
| Mn | 613.056 | 242.926 | ppm |
| Fe | 38299.0 | 660.613 | ppm |
| Zn | 85.9888 | 29.6042 | ppm |
| Sr | 56.0429 | 6.32607 | ppm |
| Zr | 384.052 | 11.8318 | ppm |
| Mo | 11.4878 | 4.08338 | ppm |
| Hg | 52.5933 | 27.5770 | ppm |
| Pb | 1806.14 | 54.3752 | ppm |
| Rb | 131.065 | 10.2479 | ppm |
| Sn | 47.2914 | 34.0183 | ppm |
| Sb | 58.9069 | 22.9824 | ppm |
| Ba | 445.602 | 16.9988 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 11:07:39
ID: <E18>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4198.83 | 324.249 | ppm |
| Ca | 2696.81 | 173.713 | ppm |
| Ti | 1253.04 | 136.803 | ppm |
| CrLO | 116.265 | 96.3800 | ppm |
| Fe | 8089.92 | 284.671 | ppm |
| Ni | 57.7934 | 44.3585 | ppm |
| Zn | 48.3558 | 23.9001 | ppm |
| Sr | 33.7702 | 4.29253 | ppm |
| Zr | 281.469 | 8.53097 | ppm |
| Pb | 914.613 | 33.1515 | ppm |
| Rb | 19.7506 | 4.75763 | ppm |
| Sb | 46.4615 | 16.8800 | ppm |
| Ba | 72.4502 | 7.29762 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 11:12:50
ID: <E19>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3983.05 | 314.948 | ppm |
| Ca | 1018.52 | 124.959 | ppm |
| Ti | 1846.52 | 140.913 | ppm |
| Fe | 7581.43 | 276.342 | ppm |
| Zn | 74.3770 | 25.9637 | ppm |
| As | 74.9150 | 57.0449 | ppm |
| Sr | 22.0315 | 3.91452 | ppm |
| Zr | 256.058 | 8.19940 | ppm |
| Pb | 1501.89 | 42.1398 | ppm |
| Rb | 9.86792 | 4.48869 | ppm |
| Sn | 46.5339 | 24.6193 | ppm |
| Sb | 50.0640 | 16.2986 | ppm |
| Ba | 50.9401 | 6.51250 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 11:22:39
ID: <E19 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4242.23 | 324.454 | ppm |
| Ca | 2022.31 | 156.219 | ppm |
| Ti | 1392.29 | 133.621 | ppm |
| Fe | 7856.99 | 281.596 | ppm |
| Zn | 43.3687 | 24.4799 | ppm |
| Sr | 19.8747 | 3.75965 | ppm |
| Zr | 303.002 | 8.86102 | ppm |
| Pb | 1146.24 | 37.0324 | ppm |
| Rb | 23.7837 | 5.04106 | ppm |
| Sn | 51.3769 | 26.3699 | ppm |
| Sb | 55.5870 | 17.4776 | ppm |
| Ba | 60.0518 | 7.02250 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 11:29:24
ID: <E20>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3646.36 | 304.095 ppm |
| Ca | 848.953 | 117.742 ppm |
| Ti | 1690.35 | 137.792 ppm |
| CrLO | 132.556 | 86.6597 ppm |
| Fe | 7214.16 | 270.001 ppm |
| Ni | 50.0473 | 45.6584 ppm |
| Zn | 89.6278 | 26.7908 ppm |
| Sr | 22.1262 | 3.79480 ppm |
| Zr | 370.367 | 9.68215 ppm |
| Pb | 878.676 | 32.5403 ppm |
| Rb | 17.0004 | 4.67377 ppm |
| Sn | 63.7312 | 27.2091 ppm |
| Sb | 43.9639 | 17.6853 ppm |
| Ba | 102.066 | 8.25191 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 11:34:41
ID: <E21>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 5699.18 | 364.535 ppm |
| Ca | 1632.89 | 148.998 ppm |
| Ti | 2527.48 | 156.739 ppm |
| Fe | 8154.41 | 287.629 ppm |
| Co | 276.300 | 117.847 ppm |
| Ni | 53.1598 | 47.5656 ppm |
| Sr | 27.5135 | 4.01996 ppm |
| Zr | 455.131 | 10.7746 ppm |
| Pb | 429.218 | 23.6511 ppm |
| Rb | 20.9498 | 4.76795 ppm |
| Ba | 93.7792 | 8.17342 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 11:40:24
ID: <HE1>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4000.91 | 318.338 | ppm |
| Ca | 2491.45 | 168.015 | ppm |
| Ti | 1377.76 | 127.673 | ppm |
| CrLO | 130.317 | 85.2548 | ppm |
| Fe | 7345.56 | 272.504 | ppm |
| Sr | 21.4219 | 3.80045 | ppm |
| Zr | 277.014 | 8.45342 | ppm |
| Pb | 1053.49 | 35.5091 | ppm |
| Rb | 13.5531 | 4.54515 | ppm |
| Sn | 101.390 | 25.3311 | ppm |
| Sb | 46.2596 | 16.4299 | ppm |
| Ba | 68.8977 | 7.04297 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 11:44:27
ID: <HE1 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3909.99 | 317.106 | ppm |
| Ca | 3290.38 | 187.165 | ppm |
| Ti | 1734.88 | 134.633 | ppm |
| Mn | 250.431 | 163.779 | ppm |
| Fe | 7815.85 | 280.756 | ppm |
| Zn | 65.0822 | 24.7616 | ppm |
| Sr | 21.7501 | 3.77701 | ppm |
| Zr | 271.439 | 8.38360 | ppm |
| Pb | 1015.63 | 34.9061 | ppm |
| Rb | 20.0852 | 4.80554 | ppm |
| Sn | 92.9226 | 23.8881 | ppm |
| Sb | 41.1554 | 15.2133 | ppm |
| Ba | 62.6562 | 6.67345 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 12:04:27
ID: <E23>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3374.72 | 297.931 ppm |
| Ca | 1708.24 | 145.573 ppm |
| Ti | 1854.94 | 145.776 ppm |
| CrLO | 116.560 | 91.8420 ppm |
| Fe | 8106.21 | 284.953 ppm |
| Zn | 121.752 | 25.8454 ppm |
| As | 126.087 | 62.9847 ppm |
| Sr | 18.6119 | 3.70884 ppm |
| Zr | 239.850 | 7.99440 ppm |
| Pb | 1840.24 | 46.6734 ppm |
| Sn | 33.0967 | 21.9333 ppm |
| Sb | 28.4089 | 13.8461 ppm |
| Ba | 34.6741 | 5.59799 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 12:16:32
ID: <E24>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 4439.01 | 328.988 ppm |
| Ca | 1373.00 | 137.675 ppm |
| Ti | 2039.23 | 149.298 ppm |
| Mn | 169.359 | 167.125 ppm |
| Fe | 6164.02 | 251.040 ppm |
| Zn | 55.7480 | 24.3672 ppm |
| As | 29.3450 | 19.6752 ppm |
| Sr | 20.7404 | 3.56721 ppm |
| Zr | 342.202 | 9.17710 ppm |
| Mo | 6.06699 | 3.08600 ppm |
| Pb | 70.1960 | 12.2377 ppm |
| Rb | 21.0659 | 4.58002 ppm |
| Sn | 41.1072 | 27.8382 ppm |
| Ba | 87.2859 | 7.95763 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:16:37
ID: <E4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4367.40 | 351.513 | ppm |
| Ca | 14997.4 | 367.839 | ppm |
| Ti | 1500.75 | 138.157 | ppm |
| CrLO | 101.500 | 98.2742 | ppm |
| Mn | 185.780 | 171.908 | ppm |
| Fe | 7188.08 | 275.350 | ppm |
| Zn | 119.652 | 29.3702 | ppm |
| Sr | 37.0096 | 4.59464 | ppm |
| Zr | 230.005 | 7.92608 | ppm |
| Pb | 1026.39 | 35.6649 | ppm |
| Rb | 18.8818 | 4.97632 | ppm |
| Sn | 67.3715 | 27.4060 | ppm |
| Sb | 59.5938 | 18.0083 | ppm |
| Ba | 63.2360 | 7.24555 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 17-JUN-1992 12:20:59
ID: <E4 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4099.03 | 333.450 | ppm |
| Ca | 8955.53 | 289.233 | ppm |
| Ti | 1717.16 | 144.659 | ppm |
| CrLO | 223.235 | 100.361 | ppm |
| Mn | 398.465 | 177.786 | ppm |
| Fe | 7838.93 | 284.117 | ppm |
| Ni | 64.8708 | 47.4101 | ppm |
| Zn | 103.176 | 27.6914 | ppm |
| As | 64.7300 | 42.7267 | ppm |
| Sr | 15.9229 | 3.52833 | ppm |
| Zr | 219.227 | 7.63242 | ppm |
| Pb | 749.206 | 30.6405 | ppm |
| Rb | 19.2257 | 4.83033 | ppm |
| Sn | 60.3524 | 26.6605 | ppm |
| Sb | 50.5138 | 17.4999 | ppm |
| Ba | 76.9403 | 7.54025 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 12:22:40
ID: <E26>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 488.052 | 207.263 | ppm |
| K | 5322.02 | 354.725 | ppm |
| Ca | 1479.38 | 143.923 | ppm |
| Ti | 1888.93 | 159.003 | ppm |
| CrLO | 334.889 | 106.215 | ppm |
| Fe | 18371.3 | 427.924 | ppm |
| Co | 241.448 | 154.990 | ppm |
| Zn | 114.813 | 29.9761 | ppm |
| Sr | 35.7665 | 4.74414 | ppm |
| Zr | 264.243 | 8.75834 | ppm |
| Pb | 1042.39 | 37.2353 | ppm |
| Rb | 44.6001 | 6.28694 | ppm |
| Sn | 42.2097 | 27.5019 | ppm |
| Sb | 22.1572 | 17.7716 | ppm |
| Ba | 95.5252 | 8.30822 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 12:28:24
ID: <E27>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 215.942 | 189.084 | ppm |
| K | 4106.53 | 320.726 | ppm |
| Ca | 2007.50 | 155.990 | ppm |
| Ti | 1566.14 | 142.495 | ppm |
| CrLO | 326.905 | 109.470 | ppm |
| Mn | 239.192 | 179.822 | ppm |
| Fe | 16661.5 | 407.271 | ppm |
| Co | 236.236 | 149.811 | ppm |
| Ni | 63.9568 | 53.3326 | ppm |
| Zn | 153.233 | 31.8683 | ppm |
| As | 290.962 | 70.3681 | ppm |
| Sr | 30.2228 | 4.61007 | ppm |
| Zr | 124.914 | 6.30271 | ppm |
| Pb | 2031.38 | 51.3424 | ppm |
| Rb | 28.2360 | 5.84576 | ppm |
| Sb | 48.3605 | 16.2314 | ppm |
| Ba | 65.7912 | 7.14177 | ppm |

NLI 002 1307

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 12:47:34
ID: <4328-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -191.811 | 171.895 | ppm |
| K | 19092.2 | 625.159 | ppm |
| Ca | 2487.18 | 202.459 | ppm |
| Ti | 5038.07 | 222.422 | ppm |
| CrLO | 75.5924 | 106.681 | ppm |
| Mn | 1422.30 | 255.081 | ppm |
| Fe | 25308.1 | 518.006 | ppm |
| Co | -227.250 | 169.086 | ppm |
| Ni | 9.53391 | 49.6348 | ppm |
| Cu | -59.6058 | 25.6711 | ppm |
| Zn | 55.7081 | 26.1687 | ppm |
| As | 7.03088 | 16.6041 | ppm |
| Se | -11.3534 | 11.2347 | ppm |
| Sr | 52.8654 | 5.48978 | ppm |
| Zr | 428.011 | 11.4663 | ppm |
| Mo | -7.34310 | 3.31999 | ppm |
| Hg | -2.87738 | 21.2635 | ppm |
| Pb | 1.70278 | 9.89177 | ppm |
| Rb | 83.5570 | 7.76929 | ppm |
| Cd | 13.4470 | 51.0877 | ppm |
| Sn | 105.059 | 30.1077 | ppm |
| Sb | 24.7440 | 18.9515 | ppm |
| Ba | 233.155 | 11.9136 | ppm |

NLI 002 1308

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 12:52:01
ID: <4500-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 31907.7 | 801.112 | ppm |
| Ca | 3617.39 | 252.612 | ppm |
| Ti | 5516.81 | 250.743 | ppm |
| Mn | 299.921 | 225.739 | ppm |
| Fe | 38278.4 | 658.169 | ppm |
| Co | 533.267 | 226.819 | ppm |
| Zn | 74.2001 | 28.7990 | ppm |
| Sr | 69.2615 | 6.76134 | ppm |
| Zr | 404.243 | 12.1094 | ppm |
| Pb | 1707.11 | 52.7388 | ppm |
| Rb | 121.950 | 9.92567 | ppm |
| Cd | 102.654 | 60.7113 | ppm |
| Sn | 92.1349 | 34.6018 | ppm |
| Sb | 37.4562 | 22.6188 | ppm |
| Ba | 439.361 | 16.8518 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 12:57:28
ID: <HE17>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3329.00 | 315.814 | ppm |
| Ca | 11416.5 | 322.463 | ppm |
| Ti | 1320.91 | 127.705 | ppm |
| CrLO | 130.254 | 91.3268 | ppm |
| Fe | 7616.91 | 279.976 | ppm |
| Ni | 60.0072 | 47.0534 | ppm |
| Zn | 39.9904 | 24.9519 | ppm |
| Sr | 29.2366 | 4.27106 | ppm |
| Zr | 267.516 | 8.46791 | ppm |
| Hg | 30.4056 | 22.3436 | ppm |
| Pb | 1271.61 | 39.3392 | ppm |
| Sn | 77.8130 | 23.6115 | ppm |
| Sb | 69.7337 | 15.7609 | ppm |
| Ba | 51.7386 | 6.33251 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 13:01:26
ID: <HE17 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3915.57 | 334.647 | ppm |
| Ca | 12436.4 | 336.654 | ppm |
| Ti | 1149.70 | 133.257 | ppm |
| Mn | 225.631 | 167.383 | ppm |
| Fe | 7773.51 | 283.723 | ppm |
| Ni | 63.5166 | 48.2208 | ppm |
| Zn | 109.459 | 28.0608 | ppm |
| Sr | 27.3527 | 4.20962 | ppm |
| Zr | 261.210 | 8.42382 | ppm |
| Mo | 5.80820 | 3.02966 | ppm |
| Pb | 1429.95 | 41.7975 | ppm |
| Rb | 11.3049 | 4.65502 | ppm |
| Sn | 92.4584 | 24.1219 | ppm |
| Sb | 57.3679 | 15.6903 | ppm |
| Ba | 47.5057 | 6.23280 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 13:08:08
ID: <HE11>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 6145.33 | 375.783 | ppm |
| Ca | 1484.60 | 145.588 | ppm |
| Ti | 2137.38 | 148.626 | ppm |
| Mn | 610.664 | 191.946 | ppm |
| Fe | 8378.42 | 291.464 | ppm |
| Zn | 60.7128 | 24.6119 | ppm |
| Sr | 23.7902 | 3.80210 | ppm |
| Zr | 333.213 | 9.21013 | ppm |
| Hg | 23.3471 | 20.5592 | ppm |
| Pb | 154.675 | 15.8279 | ppm |
| Rb | 30.1444 | 5.08319 | ppm |
| Cd | 57.9112 | 45.9593 | ppm |
| Sn | 99.0567 | 26.8314 | ppm |
| Sb | 27.9466 | 17.2166 | ppm |
| Ba | 98.3762 | 8.05502 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 13:13:03
ID: <HE11 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 5731.82 | 364.604 | ppm |
| Ca | 1072.21 | 131.675 | ppm |
| Ti | 2061.64 | 149.309 | ppm |
| Mn | 223.539 | 170.809 | ppm |
| Fe | 8840.79 | 297.786 | ppm |
| Sr | 27.1631 | 3.92191 | ppm |
| Zr | 378.250 | 9.77401 | ppm |
| Pb | 182.112 | 16.6694 | ppm |
| Rb | 27.7484 | 4.95321 | ppm |
| Sn | 109.909 | 28.5630 | ppm |
| Sb | 71.8664 | 18.9899 | ppm |
| Ba | 115.354 | 8.67826 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 15:00:30
ID: <HE19>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4229.95 | 322.344 | ppm |
| Ca | 840.589 | 119.120 | ppm |
| Ti | 1734.47 | 132.604 | ppm |
| CrLO | 100.863 | 75.5732 | ppm |
| Fe | 7504.73 | 275.401 | ppm |
| Ni | 62.1013 | 45.4519 | ppm |
| Sr | 26.3391 | 3.99930 | ppm |
| Zr | 311.153 | 8.92246 | ppm |
| Pb | 858.735 | 32.2412 | ppm |
| Rb | 8.76874 | 4.23085 | ppm |
| Sn | 142.625 | 26.2372 | ppm |
| Sb | 75.2203 | 17.2958 | ppm |
| Ba | 60.1992 | 6.81397 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 15:10:46
ID: <E22>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3880.23 | 315.792 | ppm |
| Ca | 2718.75 | 173.929 | ppm |
| Ti | 1450.56 | 136.335 | ppm |
| CrLO | 334.917 | 99.8105 | ppm |
| Fe | 10958.7 | 329.610 | ppm |
| Zn | 163.339 | 28.5322 | ppm |
| As | 88.8078 | 63.7197 | ppm |
| Sr | 12.5830 | 3.54076 | ppm |
| Zr | 192.481 | 7.30437 | ppm |
| Hg | 44.9221 | 22.6954 | ppm |
| Pb | 1863.39 | 47.5866 | ppm |
| Rb | 5.16902 | 4.34166 | ppm |
| Sn | 26.0832 | 22.1777 | ppm |
| Sb | 59.0072 | 14.6217 | ppm |
| Ba | 39.5295 | 5.84468 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 15:27:15
ID: <E28>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4031.95 | 317.354 | ppm |
| Ca | 1624.37 | 144.267 | ppm |
| Ti | 1906.11 | 145.113 | ppm |
| CrLO | 120.310 | 89.1942 | ppm |
| Fe | 7770.73 | 278.789 | ppm |
| Ni | 62.1736 | 45.3833 | ppm |
| Cu | 35.2408 | 28.2213 | ppm |
| Zn | 77.6992 | 24.6339 | ppm |
| As | 40.2794 | 33.2868 | ppm |
| Sr | 21.7974 | 3.68168 | ppm |
| Zr | 264.988 | 8.20195 | ppm |
| Pb | 437.964 | 23.6063 | ppm |
| Rb | 8.65241 | 4.02273 | ppm |
| Sn | 38.4815 | 24.3262 | ppm |
| Sb | 40.2339 | 15.8318 | ppm |
| Ba | 58.1384 | 6.68414 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 15:36:41
ID: <E29>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3768.92 | 324.907 | ppm |
| Ca | 8781.68 | 288.019 | ppm |
| Ti | 1073.79 | 131.695 | ppm |
| Fe | 7819.63 | 285.319 | ppm |
| Ni | 51.1597 | 49.1346 | ppm |
| Cu | 70.6086 | 34.2082 | ppm |
| Zn | 200.000 | 33.0341 | ppm |
| Sr | 19.5497 | 4.33654 | ppm |
| Zr | 115.683 | 6.09664 | ppm |
| Mo | 5.44410 | 2.75945 | ppm |
| Pb | 3979.09 | 70.0699 | ppm |
| Sn | 41.8633 | 23.4887 | ppm |
| Sb | 84.5471 | 16.3931 | ppm |
| Ba | 29.8924 | 5.66419 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 15:38:24
ID: <E29 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3708.53 | 317.054 | ppm |
| Ca | 5841.28 | 239.760 | ppm |
| Ti | 1087.26 | 132.676 | ppm |
| Fe | 8634.50 | 297.967 | ppm |
| Cu | 39.5153 | 31.6822 | ppm |
| Zn | 181.508 | 31.4766 | ppm |
| Sr | 20.9483 | 4.39264 | ppm |
| Zr | 115.655 | 6.09670 | ppm |
| Hg | 52.0479 | 25.9387 | ppm |
| Pb | 3958.30 | 70.0818 | ppm |
| Sn | 60.6045 | 23.3530 | ppm |
| Sb | 88.4799 | 16.2639 | ppm |
| Ba | 39.3516 | 5.96578 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 15:42:30
ID: <E29 2' S>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2770.61 | 274.660 | ppm |
| Ca | 932.450 | 117.622 | ppm |
| Ti | 1327.57 | 124.813 | ppm |
| CrLO | 168.373 | 82.9396 | ppm |
| Fe | 5435.61 | 233.421 | ppm |
| Cu | 59.7386 | 27.0800 | ppm |
| Zn | 142.226 | 25.0412 | ppm |
| As | 40.1770 | 28.9136 | ppm |
| Sr | 13.4630 | 3.08064 | ppm |
| Zr | 200.742 | 7.02897 | ppm |
| Mo | 4.45187 | 2.50594 | ppm |
| Pb | 332.093 | 20.3535 | ppm |
| Rb | 12.0026 | 3.94260 | ppm |
| Sn | 46.5999 | 22.2284 | ppm |
| Sb | 40.1526 | 13.9483 | ppm |
| Ba | 50.3972 | 6.09263 | ppm |

NLI 002 1314

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 15:47:30
ID: <E29 2' S REP>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| CrHI | 185.785 | 170.916 ppm |
| K | 3409.17 | 295.233 ppm |
| Ca | 533.351 | 104.412 ppm |
| Ti | 1448.49 | 127.525 ppm |
| CrLO | 413.234 | 96.0015 ppm |
| Fe | 6128.43 | 247.987 ppm |
| Zn | 60.6043 | 22.7042 ppm |
| As | 66.8388 | 33.9349 ppm |
| Sr | 11.0756 | 3.04089 ppm |
| Zr | 184.394 | 6.79929 ppm |
| Pb | 466.383 | 23.8361 ppm |
| Rb | 17.5499 | 4.36501 ppm |
| Sb | 24.9249 | 14.4519 ppm |
| Ba | 44.0105 | 5.97041 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 16:00:11
ID: <HE4>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3161.52 | 289.386 ppm |
| Ca | 1441.58 | 135.749 ppm |
| Ti | 1313.18 | 112.420 ppm |
| CrLO | 92.2111 | 66.8141 ppm |
| Mn | 448.559 | 178.545 ppm |
| Fe | 5933.22 | 246.432 ppm |
| Sr | 18.6314 | 3.49320 ppm |
| Zr | 263.900 | 8.09689 ppm |
| Pb | 434.677 | 23.3044 ppm |
| Rb | 19.3283 | 4.56575 ppm |
| Sn | 181.558 | 28.1751 ppm |
| Sb | 84.6923 | 18.2918 ppm |
| Ba | 79.8504 | 7.54594 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 16:20:43
ID: <4328-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -185.670 | 173.390 | ppm |
| K | 18455.9 | 615.476 | ppm |
| Ca | 2442.28 | 200.389 | ppm |
| Ti | 5005.13 | 230.812 | ppm |
| CrLO | 20.0720 | 110.896 | ppm |
| Mn | 1945.67 | 275.578 | ppm |
| Fe | 25076.6 | 515.673 | ppm |
| Co | -194.886 | 169.473 | ppm |
| Ni | 6.85706 | 49.6236 | ppm |
| Cu | -64.5684 | 25.2654 | ppm |
| Zn | 56.6790 | 26.1531 | ppm |
| As | 40.7837 | 17.7304 | ppm |
| Se | -9.57080 | 11.3147 | ppm |
| Sr | 44.0410 | 5.12378 | ppm |
| Zr | 410.996 | 11.2269 | ppm |
| Mo | -1.96089 | 3.42581 | ppm |
| Hg | -18.3743 | 20.3090 | ppm |
| Pb | -2.04246 | 9.64190 | ppm |
| Rb | 83.4023 | 7.76122 | ppm |
| Cd | 168.766 | 52.5259 | ppm |
| Sn | 75.5475 | 29.3783 | ppm |
| Sb | 16.1923 | 19.2521 | ppm |
| Ba | 217.620 | 11.5727 | ppm |

NLI 02 1316

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 16:25:14
ID: <4500-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 31746.4 | 799.445 | ppm |
| Ca | 4131.55 | 261.568 | ppm |
| Ti | 5691.59 | 252.619 | ppm |
| Fe | 37527.2 | 652.281 | ppm |
| Ni | 136.230 | 64.9399 | ppm |
| Zn | 132.907 | 31.5355 | ppm |
| Sr | 51.7413 | 6.11549 | ppm |
| Zr | 387.770 | 11.8245 | ppm |
| Hg | 58.5427 | 27.7138 | ppm |
| Pb | 1723.78 | 52.9912 | ppm |
| Rb | 132.783 | 10.2364 | ppm |
| Cd | 189.171 | 61.5226 | ppm |
| Sn | 108.389 | 34.7723 | ppm |
| Sb | 63.3949 | 23.4574 | ppm |
| Ba | 414.851 | 16.4591 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 16:44:43
ID: <W1 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 5066.74 | 347.943 | ppm |
| Ca | 712.490 | 118.207 | ppm |
| Ti | 1679.09 | 139.983 | ppm |
| CrLO | 163.055 | 101.872 | ppm |
| Fe | 15307.9 | 393.809 | ppm |
| Cu | 120.833 | 39.7144 | ppm |
| Zn | 140.692 | 34.2909 | ppm |
| Sr | 33.1720 | 5.18196 | ppm |
| Zr | 65.7599 | 5.18136 | ppm |
| Pb | 4454.72 | 76.6216 | ppm |
| Rb | 38.2240 | 6.87045 | ppm |
| Sn | 154.460 | 29.2101 | ppm |
| Sb | 124.740 | 19.7357 | ppm |
| Ba | 53.5800 | 7.13236 | ppm |

NLI 002 1317

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 16:49:34
ID: <W1 REP 2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4052.32 | 317.726 | ppm |
| Ca | 1215.07 | 131.850 | ppm |
| Ti | 791.854 | 114.327 | ppm |
| CrLO | 261.057 | 102.739 | ppm |
| Fe | 12765.0 | 357.940 | ppm |
| Co | 352.028 | 141.681 | ppm |
| Cu | 180.588 | 40.8364 | ppm |
| Zn | 158.654 | 33.8733 | ppm |
| Sr | 22.4081 | 4.46898 | ppm |
| Zr | 56.2385 | 4.67669 | ppm |
| Mo | 3.54821 | 2.60864 | ppm |
| Pb | 3178.86 | 63.4314 | ppm |
| Rb | 28.4810 | 6.12405 | ppm |
| Sn | 122.614 | 27.7682 | ppm |
| Sb | 97.6234 | 17.9543 | ppm |
| Ba | 43.8160 | 6.60330 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 16:54:29
ID: <W12>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4575.01 | 332.457 | ppm |
| Ca | 685.625 | 115.261 | ppm |
| Ti | 1372.32 | 141.896 | ppm |
| Fe | 15131.7 | 388.506 | ppm |
| Zn | 120.778 | 32.5462 | ppm |
| Sr | 17.1977 | 4.17730 | ppm |
| Zr | 62.1272 | 4.80018 | ppm |
| Mo | 4.01381 | 2.63752 | ppm |
| Pb | 2846.17 | 60.1948 | ppm |
| Rb | 38.0130 | 6.43259 | ppm |
| Sn | 72.4365 | 25.9316 | ppm |
| Sb | 77.2560 | 17.4635 | ppm |
| Ba | 36.9960 | 6.21846 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 17:02:06
ID: <W4-REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4465.37 | 343.855 | ppm |
| Ca | 8336.80 | 282.068 | ppm |
| Ti | 1036.32 | 128.111 | ppm |
| Mn | 344.650 | 182.426 | ppm |
| Fe | 9853.56 | 319.130 | ppm |
| Ni | 59.8370 | 50.6655 | ppm |
| Zn | 241.843 | 34.6644 | ppm |
| As | 123.576 | 86.7542 | ppm |
| Sr | 22.9187 | 4.45532 | ppm |
| Zr | 183.064 | 7.46660 | ppm |
| Pb | 3464.60 | 66.0892 | ppm |
| Rb | 38.2772 | 6.43833 | ppm |
| Sn | 106.160 | 25.8300 | ppm |
| Sb | 62.5315 | 16.4032 | ppm |
| Ba | 50.4226 | 6.60274 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 17:06:44
ID: <W4 2' S >
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2861.57 | 277.482 | ppm |
| Ca | 748.730 | 110.960 | ppm |
| Ti | 1469.55 | 122.131 | ppm |
| CrLO | 122.908 | 76.8795 | ppm |
| Fe | 5976.65 | 243.562 | ppm |
| Zn | 57.3989 | 21.8839 | ppm |
| Sr | 16.9912 | 3.32776 | ppm |
| Zr | 212.437 | 7.23892 | ppm |
| Mo | 3.80419 | 2.55161 | ppm |
| Pb | 485.392 | 24.1590 | ppm |
| Rb | 14.8902 | 4.17806 | ppm |
| Sb | 14.3538 | 13.6187 | ppm |
| Ba | 54.6225 | 6.22345 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 17:26:05
ID: <W9 REP>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 4880.44 | 360.892 ppm |
| Ca | 10492.1 | 314.822 ppm |
| Ti | 1220.32 | 134.948 ppm |
| Mn | 396.411 | 191.941 ppm |
| Fe | 10712.2 | 334.066 ppm |
| Zn | 157.724 | 30.3809 ppm |
| Sr | 38.6672 | 5.26044 ppm |
| Zr | 316.479 | 9.83071 ppm |
| Pb | 4672.71 | 77.9269 ppm |
| Rb | 15.4359 | 5.76891 ppm |
| Sn | 137.858 | 29.2500 ppm |
| Sb | 111.862 | 19.8024 ppm |
| Ba | 84.3930 | 8.14692 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 17:57:37
ID: <HW1>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3984.27 | 315.344 ppm |
| Ca | 924.374 | 121.906 ppm |
| Ti | 949.391 | 128.368 ppm |
| Mn | 291.971 | 187.566 ppm |
| Fe | 17279.2 | 415.144 ppm |
| Ni | 62.3429 | 55.8843 ppm |
| Cu | 37.7475 | 36.4864 ppm |
| Zn | 66.5806 | 32.2593 ppm |
| Sr | 21.5388 | 4.48924 ppm |
| Zr | 111.036 | 6.11276 ppm |
| Pb | 2940.96 | 61.8561 ppm |
| Rb | 48.7390 | 6.97996 ppm |
| Sn | 168.920 | 29.2020 ppm |
| Sb | 119.750 | 19.5778 ppm |
| Ba | 39.8011 | 6.59452 ppm |

NLI 002 1320

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 18:08:13
ID: <HW12>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 5072.77 | 352.318 | ppm |
| Ca | 2114.25 | 162.727 | ppm |
| Ti | 1644.13 | 151.474 | ppm |
| Fe | 18405.8 | 431.709 | ppm |
| Cu | 140.376 | 39.8892 | ppm |
| Zn | 175.668 | 34.4872 | ppm |
| Sr | 22.1728 | 4.96504 | ppm |
| Zr | 81.1901 | 5.71325 | ppm |
| Pb | 5637.51 | 88.2131 | ppm |
| Rb | 32.9451 | 6.94909 | ppm |
| Sn | 197.561 | 28.2316 | ppm |
| Sb | 118.052 | 18.5052 | ppm |
| Ba | 50.6636 | 6.81735 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 24-JUN-1992 18:12:07
ID: <HW12 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 7408.29 | 411.738 | ppm |
| Ca | 2156.62 | 169.576 | ppm |
| Ti | 2376.43 | 170.853 | ppm |
| CrLO | 141.350 | 112.146 | ppm |
| Fe | 19513.1 | 445.764 | ppm |
| Cu | 151.216 | 39.3603 | ppm |
| Zn | 282.650 | 36.8916 | ppm |
| Sr | 23.3496 | 4.93072 | ppm |
| Zr | 71.1822 | 5.40989 | ppm |
| Mo | 3.55174 | 2.69430 | ppm |
| Hg | 32.2293 | 27.5710 | ppm |
| Pb | 5103.02 | 84.3360 | ppm |
| Rb | 42.0396 | 7.16011 | ppm |
| Sn | 107.436 | 24.5516 | ppm |
| Sb | 74.9808 | 15.9628 | ppm |
| Ba | 39.6001 | 6.09893 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 07:18:13
ID: <ECAL>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 1802.52 | 586.152 | ppm |
| K | 792.030 | 236.818 | ppm |
| Ca | 10777.8 | 297.868 | ppm |
| Ti | 140.763 | 71.1395 | ppm |
| CrLO | 495.780 | 133.370 | ppm |
| Fe | 527.184 | 248.549 | ppm |
| Ni | 271.926 | 121.240 | ppm |
| Cu | 138.832 | 75.4841 | ppm |
| Zn | 137.765 | 57.8360 | ppm |
| Pb | 182272 | 1318.57 | ppm |
| Cd | 423.884 | 98.3326 | ppm |
| Sn | 255.483 | 64.7608 | ppm |
| Sb | 262.757 | 49.7103 | ppm |
| Ba | 112.725 | 18.7922 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 07:35:02
ID: <RESCK>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 111.314 | 54.7188 | ppm |
| CrLO | 100.681 | 0.0686258 | ppm |
| Fe | 1.57446e+06 | 7458.85 | ppm |
| Ni | 2734.92 | 1044.89 | ppm |
| Mo | 21.5557 | 12.9017 | ppm |
| Cd | 49.1652 | 0.235715 | ppm |

NLI 002 1322

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 07:43:09
ID: <4328>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -113.051 | 179.522 | ppm |
| K | 18902.5 | 622.046 | ppm |
| Ca | 2132.82 | 194.199 | ppm |
| Ti | 4657.99 | 224.219 | ppm |
| CrLO | -38.0904 | 107.120 | ppm |
| Mn | 1629.47 | 263.503 | ppm |
| Fe | 25152.8 | 515.878 | ppm |
| Co | -308.000 | 166.494 | ppm |
| Ni | 130.678 | 56.4817 | ppm |
| Cu | -8.31593 | 29.4041 | ppm |
| Zn | -5.92235 | 23.0791 | ppm |
| As | 13.9363 | 17.5243 | ppm |
| Se | -15.2806 | 11.0173 | ppm |
| Sr | 53.0784 | 5.49127 | ppm |
| Zr | 406.438 | 11.1705 | ppm |
| Mo | -1.94418 | 3.40880 | ppm |
| Hg | -0.736452 | 21.3126 | ppm |
| Pb | 11.6689 | 10.4787 | ppm |
| Rb | 80.2302 | 7.64468 | ppm |
| Cd | 4.30579 | 51.0160 | ppm |
| Sn | 18.4445 | 28.6969 | ppm |
| Sb | 48.1616 | 19.4377 | ppm |
| Ba | 225.833 | 11.7390 | ppm |

NLI 002 1323

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 07:48:17
ID: <4330>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 591.611 | 254.168 | ppm |
| K | 10380.7 | 507.904 | ppm |
| Ca | 37982.5 | 579.495 | ppm |
| Ti | 1174.96 | 136.998 | ppm |
| Mn | 2035.46 | 380.368 | ppm |
| Fe | 157175 | 1424.50 | ppm |
| Co | 886.538 | 458.716 | ppm |
| Cu | 253.260 | 60.8844 | ppm |
| Zn | 427.948 | 54.3022 | ppm |
| Sr | 55.0277 | 8.21263 | ppm |
| Zr | 101.762 | 8.51080 | ppm |
| Pb | 227.484 | 29.7156 | ppm |
| Rb | 68.3856 | 10.9217 | ppm |
| Cd | 106.831 | 82.8925 | ppm |
| Ba | 71.8132 | 11.0781 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 07:53:41
ID: <4500>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 33132.5 | 816.121 | ppm |
| Ca | 3695.06 | 256.667 | ppm |
| Ti | 5830.33 | 259.713 | ppm |
| Mn | 764.216 | 254.836 | ppm |
| Fe | 41663.2 | 691.361 | ppm |
| Ni | 145.375 | 68.4566 | ppm |
| Cu | 50.2438 | 36.7262 | ppm |
| Sr | 56.9209 | 6.42857 | ppm |
| Zr | 388.140 | 12.0412 | ppm |
| Pb | 1867.48 | 55.9053 | ppm |
| Rb | 125.342 | 10.2212 | ppm |
| Cd | 79.4424 | 61.8072 | ppm |
| Sn | 37.4411 | 34.4535 | ppm |
| Sb | 43.4679 | 23.1263 | ppm |
| Ba | 451.385 | 17.2673 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 07:57:43
ID: <4497>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 313.959 | 229.675 | ppm |
| K | 20983.1 | 676.098 | ppm |
| Ca | 12776.5 | 374.930 | ppm |
| Ti | 4963.12 | 232.659 | ppm |
| CrLO | 247.693 | 124.063 | ppm |
| Mn | 779.659 | 252.482 | ppm |
| Fe | 29893.4 | 585.364 | ppm |
| Co | 339.833 | 206.006 | ppm |
| Zn | 154.653 | 34.9115 | ppm |
| Sr | 122.260 | 9.71443 | ppm |
| Zr | 361.138 | 12.5777 | ppm |
| Pb | 11537.2 | 144.757 | ppm |
| Rb | 86.0207 | 10.4805 | ppm |
| Cd | 76.5935 | 61.8350 | ppm |
| Sn | 52.2792 | 34.9448 | ppm |
| Sb | 79.7809 | 24.1331 | ppm |
| Ba | 273.424 | 14.5563 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 08:09:07
ID: <4500-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 31533.6 | 796.326 | ppm |
| Ca | 3025.67 | 240.732 | ppm |
| Ti | 5851.24 | 249.550 | ppm |
| Mn | 829.593 | 251.524 | ppm |
| Fe | 38592.6 | 661.302 | ppm |
| Zn | 124.586 | 30.8738 | ppm |
| Sr | 73.4948 | 6.91754 | ppm |
| Zr | 365.836 | 11.5592 | ppm |
| Pb | 1666.09 | 52.1422 | ppm |
| Rb | 128.790 | 10.1345 | ppm |
| Cd | 149.069 | 59.6303 | ppm |
| Ba | 418.539 | 16.4262 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 09:00:50
ID: <W5 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2776.32 | 280.730 | ppm |
| Ca | 3389.95 | 187.469 | ppm |
| Ti | 830.241 | 120.864 | ppm |
| Fe | 6057.34 | 251.868 | ppm |
| Ni | 101.225 | 52.1416 | ppm |
| Zn | 129.664 | 31.4501 | ppm |
| Sr | 26.1198 | 4.31158 | ppm |
| Zr | 185.481 | 7.18492 | ppm |
| Pb | 2281.06 | 51.8043 | ppm |
| Rb | 19.9436 | 5.34269 | ppm |
| Sn | 124.658 | 25.8115 | ppm |
| Sb | 98.7586 | 17.2265 | ppm |
| Ba | 42.6410 | 6.22856 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 09:07:22
ID: <W9 REP 2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3086.36 | 298.365 | ppm |
| Ca | 6529.94 | 249.724 | ppm |
| Ti | 812.088 | 118.136 | ppm |
| CrLO | 182.473 | 96.9582 | ppm |
| Fe | 5966.16 | 249.317 | ppm |
| Co | 126.951 | 104.596 | ppm |
| Cu | 76.8969 | 32.3703 | ppm |
| Zn | 99.9357 | 27.6529 | ppm |
| Sr | 24.2081 | 4.12129 | ppm |
| Zr | 189.495 | 7.21729 | ppm |
| Pb | 2199.99 | 50.9202 | ppm |
| Rb | 5.35318 | 4.48157 | ppm |
| Sn | 137.500 | 26.2356 | ppm |
| Sb | 73.4664 | 16.9309 | ppm |
| Ba | 48.0053 | 6.44693 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 09:15:09
ID: <HW4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2598.69 | 277.150 | ppm |
| Ca | 4898.73 | 218.366 | ppm |
| Ti | 657.572 | 107.093 | ppm |
| Mn | 475.772 | 181.051 | ppm |
| Fe | 5220.15 | 235.451 | ppm |
| Ni | 56.8331 | 49.2875 | ppm |
| Zn | 215.052 | 34.1696 | ppm |
| Sr | 37.3262 | 4.60735 | ppm |
| Zr | 149.963 | 6.44387 | ppm |
| Pb | 1233.69 | 38.2776 | ppm |
| Rb | 7.21599 | 4.51769 | ppm |
| Sn | 75.2508 | 23.5273 | ppm |
| Sb | 60.8803 | 15.6969 | ppm |
| Ba | 25.4968 | 5.35490 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 09:21:04
ID: <W7 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2754.65 | 291.270 | ppm |
| Ca | 8555.73 | 281.603 | ppm |
| Ti | 950.877 | 111.960 | ppm |
| CrLO | 216.465 | 100.128 | ppm |
| Mn | 285.272 | 173.692 | ppm |
| Fe | 5453.85 | 240.957 | ppm |
| Zn | 219.618 | 33.0726 | ppm |
| Sr | 31.0668 | 4.44061 | ppm |
| Zr | 175.768 | 7.00159 | ppm |
| Pb | 1993.79 | 48.5740 | ppm |
| Rb | 23.1054 | 5.33756 | ppm |
| Sn | 35.8281 | 24.2127 | ppm |
| Sb | 51.1093 | 16.4640 | ppm |
| Ba | 50.9932 | 6.49239 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 09:40:20
ID: <W13 SOIL>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4074.71 | 315.953 | ppm |
| Ca | 356.922 | 99.4843 | ppm |
| Ti | 1317.92 | 132.005 | ppm |
| Fe | 17448.6 | 415.605 | ppm |
| Se | 18.0237 | 13.9131 | ppm |
| Sr | 33.6725 | 4.65141 | ppm |
| Zr | 204.128 | 7.69018 | ppm |
| Pb | 737.013 | 31.6218 | ppm |
| Rb | 60.3720 | 6.88879 | ppm |
| Sn | 171.145 | 30.7271 | ppm |
| Sb | 48.6061 | 19.2351 | ppm |
| Ba | 150.734 | 9.79048 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 09:44:57
ID: <W13 HUMUS>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 1908.09 | 241.211 | ppm |
| Ca | 770.132 | 108.857 | ppm |
| Ti | 369.752 | 96.1830 | ppm |
| CrLO | 131.279 | 97.5547 | ppm |
| Fe | 6880.36 | 265.005 | ppm |
| Ni | 74.8193 | 50.8966 | ppm |
| Cu | 58.2958 | 34.4673 | ppm |
| Zn | 97.0699 | 30.6977 | ppm |
| Sr | 14.7136 | 3.90279 | ppm |
| Zr | 63.3754 | 4.64941 | ppm |
| Pb | 2902.23 | 58.3521 | ppm |
| Rb | 11.9243 | 5.15210 | ppm |
| Sn | 94.9779 | 22.7482 | ppm |
| Sb | 62.6392 | 15.0674 | ppm |
| Ba | 16.9253 | 4.81602 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 09:51:16
ID: <W14>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 228.174 | 212.377 | ppm |
| K | 2966.45 | 281.694 | ppm |
| Ca | 703.756 | 110.380 | ppm |
| Ti | 715.232 | 110.077 | ppm |
| CrLO | 132.756 | 99.8434 | ppm |
| Fe | 11496.1 | 343.085 | ppm |
| Co | 206.372 | 138.114 | ppm |
| Cu | 39.8011 | 38.9377 | ppm |
| Zn | 91.0277 | 35.7125 | ppm |
| Se | 17.8559 | 16.8096 | ppm |
| Sr | 25.9000 | 4.90721 | ppm |
| Zr | 41.6471 | 4.47050 | ppm |
| Pb | 4343.91 | 74.1812 | ppm |
| Rb | 21.3259 | 6.30784 | ppm |
| Sn | 188.956 | 31.5479 | ppm |
| Sb | 77.4059 | 19.9749 | ppm |
| Ba | 40.2764 | 6.95324 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 09:56:36
ID: <HW5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4040.66 | 319.013 | ppm |
| Ca | 2090.37 | 157.623 | ppm |
| Ti | 1249.08 | 126.497 | ppm |
| Fe | 8378.67 | 290.731 | ppm |
| Zn | 52.9039 | 26.6493 | ppm |
| Sr | 28.3230 | 4.22387 | ppm |
| Zr | 274.099 | 8.51973 | ppm |
| Pb | 1445.59 | 41.5512 | ppm |
| Rb | 30.1349 | 5.48267 | ppm |
| Sn | 143.772 | 26.1830 | ppm |
| Sb | 99.6833 | 17.6276 | ppm |
| Ba | 50.6423 | 6.51093 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:04:08
ID: <W15>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3122.93 | 285.065 | ppm |
| Ca | 444.217 | 99.7605 | ppm |
| Ti | 601.964 | 111.968 | ppm |
| CrLO | 282.366 | 107.262 | ppm |
| Fe | 8303.59 | 288.960 | ppm |
| Zn | 131.920 | 31.6112 | ppm |
| Sr | 11.9698 | 3.69261 | ppm |
| Zr | 51.3258 | 4.25752 | ppm |
| Mo | 2.71549 | 2.41057 | ppm |
| Pb | 2373.16 | 52.8799 | ppm |
| Rb | 13.8929 | 5.10849 | ppm |
| Sn | 85.5356 | 23.4055 | ppm |
| Sb | 37.6539 | 14.8774 | ppm |
| Ba | 24.4057 | 5.27405 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:08:00
ID: <W15 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2814.85 | 274.545 | ppm |
| Ca | 537.449 | 102.575 | ppm |
| Ti | 597.225 | 111.770 | ppm |
| Fe | 8478.18 | 292.421 | ppm |
| Cu | 45.2498 | 33.4837 | ppm |
| Zn | 88.9870 | 30.2907 | ppm |
| Sr | 15.3291 | 3.86200 | ppm |
| Zr | 43.5267 | 4.05969 | ppm |
| Pb | 2456.32 | 53.9248 | ppm |
| Rb | 15.5975 | 5.22048 | ppm |
| Sn | 123.477 | 24.2730 | ppm |
| Sb | 48.3544 | 15.2016 | ppm |
| Ba | 23.3120 | 5.26195 | ppm |

NLI 002 1331

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:13:25
ID: <4328-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -116.686 | 173.754 | ppm |
| K | 18557.0 | 616.591 | ppm |
| Ca | 1867.17 | 187.346 | ppm |
| Ti | 5590.01 | 231.868 | ppm |
| CrLO | -17.7182 | 106.049 | ppm |
| Mn | 1559.97 | 261.689 | ppm |
| Fe | 26907.4 | 534.245 | ppm |
| Co | -113.932 | 177.014 | ppm |
| Ni | -50.7670 | 47.2507 | ppm |
| Cu | 59.3923 | 33.5281 | ppm |
| Zn | 55.8769 | 26.7454 | ppm |
| As | -0.0631633 | 18.0882 | ppm |
| Se | -36.2009 | 10.0897 | ppm |
| Sr | 47.8909 | 5.34042 | ppm |
| Zr | 433.687 | 11.6064 | ppm |
| Mo | -2.49129 | 3.51170 | ppm |
| Hg | 1.90857 | 21.9010 | ppm |
| Pb | 25.7684 | 11.3000 | ppm |
| Rb | 73.7928 | 7.49371 | ppm |
| Cd | 4.86934 | 52.0359 | ppm |
| Sn | 25.6696 | 29.3557 | ppm |
| Sb | 37.9537 | 19.5612 | ppm |
| Ba | 227.993 | 11.8820 | ppm |

NLI 002 1332

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:17:20
ID: <4500-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -47.8872 | 189.745 | ppm |
| K | 30485.5 | 784.074 | ppm |
| Ca | 3814.44 | 253.429 | ppm |
| Ti | 5935.93 | 249.492 | ppm |
| CrLO | 242.042 | 122.639 | ppm |
| Mn | 665.140 | 242.203 | ppm |
| Fe | 39474.7 | 668.295 | ppm |
| Co | -96.6251 | 217.361 | ppm |
| Ni | 17.9113 | 58.4174 | ppm |
| Cu | 79.6904 | 37.3719 | ppm |
| Zn | 86.2245 | 29.5553 | ppm |
| As | -178.417 | 69.1258 | ppm |
| Se | -40.8158 | 12.2391 | ppm |
| Sr | 77.3144 | 7.08747 | ppm |
| Zr | 403.324 | 12.1542 | ppm |
| Mo | -1.81808 | 3.74526 | ppm |
| Hg | -7.70715 | 24.3318 | ppm |
| Pb | 1797.88 | 54.2315 | ppm |
| Rb | 126.087 | 10.1034 | ppm |
| Cd | 153.726 | 61.2946 | ppm |
| Sn | -6.96686 | 32.9099 | ppm |
| Sb | 13.7628 | 22.2752 | ppm |
| Ba | 448.346 | 17.0365 | ppm |

NLI 002 1333

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:23:05
ID: <W16>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4250.33 | 325.487 | ppm |
| Ca | 2144.51 | 160.042 | ppm |
| Ti | 828.069 | 119.626 | ppm |
| Fe | 11383.0 | 339.542 | ppm |
| Zn | 140.656 | 33.9949 | ppm |
| Sr | 34.3429 | 4.91313 | ppm |
| Zr | 59.2115 | 4.76202 | ppm |
| Mo | 8.73388 | 2.82413 | ppm |
| Pb | 2927.15 | 60.2426 | ppm |
| Rb | 37.9835 | 6.42600 | ppm |
| Sn | 241.021 | 30.8707 | ppm |
| Sb | 149.282 | 20.6854 | ppm |
| Ba | 70.8884 | 7.67929 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:28:15
ID: <W16 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3940.86 | 315.097 | ppm |
| Ca | 1751.58 | 147.986 | ppm |
| Ti | 1017.81 | 117.937 | ppm |
| Fe | 10533.0 | 326.418 | ppm |
| Zn | 131.038 | 33.2591 | ppm |
| Sr | 31.9086 | 4.71671 | ppm |
| Zr | 45.9102 | 4.29984 | ppm |
| Mo | 4.86045 | 2.59773 | ppm |
| Pb | 2483.95 | 55.1919 | ppm |
| Rb | 36.8985 | 6.24613 | ppm |
| Sn | 176.821 | 27.9597 | ppm |
| Sb | 92.8847 | 18.0795 | ppm |
| Ba | 38.8976 | 6.32629 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:33:52
ID: <W17>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 1177.84 | 209.694 | ppm |
| Ca | 751.512 | 105.670 | ppm |
| Ti | 350.769 | 82.1256 | ppm |
| CrLO | 118.107 | 96.4192 | ppm |
| Mn | 169.258 | 155.201 | ppm |
| Fe | 3344.72 | 193.298 | ppm |
| Co | 123.242 | 94.5534 | ppm |
| Cu | 69.7772 | 33.4487 | ppm |
| Zn | 119.539 | 30.0903 | ppm |
| Sr | 12.5843 | 3.93512 | ppm |
| Zr | 19.5639 | 3.33792 | ppm |
| Hg | 27.3057 | 25.0751 | ppm |
| Pb | 4105.94 | 68.8573 | ppm |
| Rb | 5.72897 | 5.03358 | ppm |
| Sn | 152.055 | 23.6746 | ppm |
| Sb | 76.9416 | 14.8914 | ppm |
| Ba | 19.4592 | 4.90886 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:40:44
ID: <HW9>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2484.98 | 285.484 | ppm |
| Ca | 9620.25 | 296.778 | ppm |
| Ti | 1152.78 | 118.447 | ppm |
| Mn | 169.916 | 166.413 | ppm |
| Fe | 6218.14 | 255.506 | ppm |
| Zn | 59.2910 | 27.7210 | ppm |
| Sr | 30.5534 | 4.41234 | ppm |
| Zr | 258.650 | 8.33869 | ppm |
| Pb | 1737.09 | 45.4944 | ppm |
| Rb | 18.6014 | 5.11618 | ppm |
| Cd | 47.2170 | 43.4546 | ppm |
| Sn | 139.008 | 26.3696 | ppm |
| Sb | 82.6237 | 17.5981 | ppm |
| Ba | 49.7339 | 6.52390 | ppm |

NLI 002 1335

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 10:54:00
ID: <W18>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4726.15 | 339.685 | ppm |
| Ca | 1603.42 | 145.988 | ppm |
| Ti | 1311.52 | 121.790 | ppm |
| CrLO | 157.715 | 81.8347 | ppm |
| Fe | 8172.40 | 287.788 | ppm |
| Cu | 92.1441 | 31.7849 | ppm |
| Zn | 168.184 | 28.7685 | ppm |
| Sr | 18.5035 | 3.94908 | ppm |
| Zr | 92.5945 | 5.36679 | ppm |
| Pb | 3183.92 | 61.7235 | ppm |
| Rb | 17.3824 | 5.19949 | ppm |
| Sn | 41.7281 | 27.7244 | ppm |
| Sb | 68.1338 | 18.8159 | ppm |
| Ba | 101.798 | 8.47724 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 11:07:53
ID: <HW7>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3261.15 | 301.673 | ppm |
| Ca | 5309.91 | 228.034 | ppm |
| Ti | 946.150 | 118.095 | ppm |
| Fe | 7134.05 | 271.106 | ppm |
| Zn | 84.2222 | 27.9590 | ppm |
| Sr | 36.3736 | 4.68127 | ppm |
| Zr | 231.434 | 7.97679 | ppm |
| Pb | 2119.93 | 50.2494 | ppm |
| Rb | 14.6444 | 4.99318 | ppm |
| Sn | 140.961 | 26.8409 | ppm |
| Sb | 93.8351 | 17.5853 | ppm |
| Ba | 66.7603 | 7.12799 | ppm |

NLI 002 1336

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 11:11:35
ID: <HW7 REP>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3852.91 | 319.605 ppm |
| Ca | 5080.06 | 224.823 ppm |
| Ti | 1088.62 | 122.278 ppm |
| Fe | 6825.25 | 265.338 ppm |
| Sr | 24.6840 | 4.17071 ppm |
| Zr | 253.011 | 8.25701 ppm |
| Pb | 2058.35 | 49.3904 ppm |
| Rb | 24.8387 | 5.39393 ppm |
| Cd | 119.562 | 45.3640 ppm |
| Sn | 131.357 | 26.7826 ppm |
| Sb | 88.5836 | 18.3575 ppm |
| Ba | 73.4872 | 7.36126 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 11:20:18
ID: <W19>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 5192.62 | 363.105 ppm |
| Ca | 4623.83 | 222.230 ppm |
| Ti | 1199.02 | 136.340 ppm |
| CrLO | 136.290 | 100.067 ppm |
| Fe | 20933.0 | 465.889 ppm |
| Ni | 66.0410 | 58.2538 ppm |
| Cu | 41.2448 | 35.8837 ppm |
| Zn | 287.870 | 37.8939 ppm |
| Sr | 63.6857 | 7.14514 ppm |
| Zr | 121.565 | 7.31761 ppm |
| Pb | 9586.07 | 121.134 ppm |
| Rb | 59.1559 | 8.66197 ppm |
| Sn | 250.129 | 36.8855 ppm |
| Sb | 263.256 | 26.5262 ppm |
| Ba | 141.716 | 10.7951 ppm |

NLI 002 1337

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 11:24:53
ID: <W19 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 462.479 | 236.086 | ppm |
| K | 8606.95 | 448.236 | ppm |
| Ca | 4954.79 | 235.812 | ppm |
| Ti | 2228.36 | 164.630 | ppm |
| Mn | 224.191 | 212.137 | ppm |
| Fe | 25925.1 | 525.753 | ppm |
| Zn | 153.125 | 37.2363 | ppm |
| Sr | 51.0708 | 7.09476 | ppm |
| Zr | 92.6592 | 6.90596 | ppm |
| Pb | 10343.2 | 130.265 | ppm |
| Rb | 57.7859 | 9.13534 | ppm |
| Sn | 457.071 | 44.5007 | ppm |
| Sb | 343.526 | 30.8357 | ppm |
| Ba | 143.562 | 11.6053 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 11:32:37
ID: <W20>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 7135.49 | 413.181 | ppm |
| Ca | 2979.77 | 192.088 | ppm |
| Ti | 1613.31 | 150.241 | ppm |
| CrLO | 271.195 | 113.569 | ppm |
| Fe | 16598.6 | 420.080 | ppm |
| Cu | 231.218 | 46.5681 | ppm |
| Zn | 248.301 | 39.3471 | ppm |
| Sr | 48.1339 | 7.12296 | ppm |
| Zr | 90.2815 | 6.91184 | ppm |
| Pb | 12737.1 | 141.891 | ppm |
| Rb | 16.6372 | 7.96521 | ppm |
| Sn | 226.872 | 38.5618 | ppm |
| Sb | 223.023 | 27.0663 | ppm |
| Ba | 98.4381 | 9.98613 | ppm |

NLI 002 1338

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 12:08:19
ID: <4328-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -162.072 | 189.409 | ppm |
| K | 18987.7 | 623.418 | ppm |
| Ca | 2222.83 | 196.410 | ppm |
| Ti | 4836.34 | 222.587 | ppm |
| CrLO | -63.3298 | 103.500 | ppm |
| Mn | 1499.63 | 260.853 | ppm |
| Fe | 24972.7 | 514.619 | ppm |
| Co | -66.9492 | 172.008 | ppm |
| Ni | 31.4834 | 51.7724 | ppm |
| Cu | 41.4884 | 32.2609 | ppm |
| Zn | 76.9833 | 27.2775 | ppm |
| As | 10.4127 | 17.4419 | ppm |
| Se | 18.3091 | 12.6554 | ppm |
| Sr | 37.8478 | 4.85162 | ppm |
| Zr | 406.733 | 11.1560 | ppm |
| Mo | -3.55406 | 3.36615 | ppm |
| Hg | -25.0177 | 19.9270 | ppm |
| Pb | 9.81756 | 10.7127 | ppm |
| Rb | 72.7972 | 7.38362 | ppm |
| Cd | 150.308 | 52.9144 | ppm |
| Sn | 41.6489 | 29.1352 | ppm |
| Sb | 12.9442 | 19.3095 | ppm |
| Ba | 221.315 | 11.6747 | ppm |

NLI 002 1339

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 12:12:32
ID: <4500-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 275.024 | 221.661 | ppm |
| K | 32316.4 | 806.107 | ppm |
| Ca | 3809.78 | 256.940 | ppm |
| Ti | 5011.09 | 252.377 | ppm |
| CrLO | -383.276 | 112.262 | ppm |
| Mn | 1053.84 | 263.777 | ppm |
| Fe | 39176.7 | 667.954 | ppm |
| Co | 25.7324 | 219.875 | ppm |
| Ni | 20.4015 | 59.2047 | ppm |
| Cu | 118.318 | 39.5184 | ppm |
| Zn | 101.800 | 30.2990 | ppm |
| As | -245.098 | 67.4566 | ppm |
| Se | -27.7215 | 12.8589 | ppm |
| Sr | 48.4007 | 5.97471 | ppm |
| Zr | 345.384 | 11.2448 | ppm |
| Mo | 3.37266 | 3.72101 | ppm |
| Hg | -22.4293 | 23.2828 | ppm |
| Pb | 1744.53 | 53.5352 | ppm |
| Rb | 149.699 | 10.7910 | ppm |
| Cd | 80.6821 | 59.0578 | ppm |
| Sn | 43.0158 | 33.0665 | ppm |
| Sb | 34.5948 | 21.9882 | ppm |
| Ba | 475.311 | 17.4253 | ppm |

NLI 002 1340

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 12:20:49
ID: <HW14>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 93.0209 | 174.802 | ppm |
| K | 4804.55 | 341.087 | ppm |
| Ca | 1110.89 | 131.284 | ppm |
| Ti | 1372.87 | 134.410 | ppm |
| CrLO | 46.1385 | 97.3656 | ppm |
| Mn | 203.896 | 174.655 | ppm |
| Fe | 14975.6 | 388.434 | ppm |
| Co | 231.351 | 145.861 | ppm |
| Ni | -9.97641 | 50.4531 | ppm |
| Cu | 73.0918 | 35.7458 | ppm |
| Zn | 93.1563 | 30.6994 | ppm |
| As | 30.3407 | 96.9132 | ppm |
| Se | -40.7324 | 13.4667 | ppm |
| Sr | 10.4303 | 4.14546 | ppm |
| Zr | 60.3272 | 4.89398 | ppm |
| Mo | -3.17287 | 2.36872 | ppm |
| Hg | 47.6960 | 27.7640 | ppm |
| Pb | 4322.28 | 75.3945 | ppm |
| Rb | 23.6540 | 6.19980 | ppm |
| Cd | -13.0781 | 37.7860 | ppm |
| Sn | 112.846 | 23.8752 | ppm |
| Sb | 43.2081 | 14.9394 | ppm |
| Ba | 26.3038 | 5.38202 | ppm |

NLI 002 1341

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 14:04:37
ID: <HW16>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3509.09 | 303.236 ppm |
| Ca | 2394.45 | 165.067 ppm |
| Ti | 617.473 | 108.775 ppm |
| Fe | 8944.08 | 302.401 ppm |
| Co | 166.293 | 122.720 ppm |
| Zn | 185.066 | 34.3248 ppm |
| Sr | 29.6689 | 4.76112 ppm |
| Zr | 43.5979 | 4.31289 ppm |
| Mo | 4.33943 | 2.58129 ppm |
| Pb | 3639.76 | 66.7987 ppm |
| Rb | 27.1948 | 6.06618 ppm |
| Cd | 82.6802 | 40.3274 ppm |
| Sn | 112.523 | 24.2248 ppm |
| Sb | 48.7729 | 15.8615 ppm |
| Ba | 17.2607 | 5.03891 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 14:20:29
ID: <W21>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 4276.31 | 329.931 ppm |
| Ca | 1723.82 | 150.398 ppm |
| Ti | 1444.73 | 140.449 ppm |
| Fe | 19467.3 | 446.619 ppm |
| Cu | 101.402 | 40.9185 ppm |
| Zn | 151.190 | 36.2059 ppm |
| Sr | 29.7090 | 5.75989 ppm |
| Zr | 105.762 | 6.68164 ppm |
| Pb | 8108.00 | 108.627 ppm |
| Rb | 25.6626 | 7.35737 ppm |
| Sn | 268.242 | 36.2189 ppm |
| Sb | 262.535 | 25.7789 ppm |
| Ba | 95.9403 | 9.33761 ppm |

NLI 002 1342

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 14:26:13
ID: <W22>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2679.47 | 276.053 | ppm |
| Ca | 1996.41 | 152.862 | ppm |
| Ti | 932.750 | 111.982 | ppm |
| Fe | 9344.97 | 311.473 | ppm |
| Co | 276.473 | 131.390 | ppm |
| Cu | 49.7849 | 37.7514 | ppm |
| Zn | 233.546 | 38.2515 | ppm |
| Sr | 44.2705 | 5.66662 | ppm |
| Zr | 74.4609 | 5.47437 | ppm |
| Pb | 5394.35 | 82.6582 | ppm |
| Rb | 27.1492 | 6.60744 | ppm |
| Cd | 104.621 | 51.3747 | ppm |
| Sn | 265.442 | 32.1826 | ppm |
| Sb | 114.363 | 20.9762 | ppm |
| Ba | 57.7669 | 7.47974 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 14:38:05
ID: <W22 3" D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2547.65 | 268.112 | ppm |
| Ca | 927.465 | 117.124 | ppm |
| Ti | 617.811 | 101.001 | ppm |
| CrLO | 370.177 | 87.7886 | ppm |
| Fe | 19397.2 | 434.835 | ppm |
| Co | 285.596 | 155.116 | ppm |
| Cu | 29.2569 | 27.4985 | ppm |
| Zn | 149.075 | 26.7652 | ppm |
| Sr | 6.39850 | 3.36681 | ppm |
| Zr | 32.7288 | 3.69276 | ppm |
| Pb | 2806.51 | 60.4564 | ppm |
| Rb | 4.68460 | 4.61313 | ppm |
| Sn | 74.5141 | 20.9566 | ppm |
| Sb | 101.121 | 14.6205 | ppm |
| Ba | 33.1891 | 5.32910 | ppm |

NLI 002 1343

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 14:44:01
ID: <HW18>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 300.087 | 211.729 | ppm |
| K | 4897.28 | 354.191 | ppm |
| Ca | 3983.41 | 208.218 | ppm |
| Ti | 1302.15 | 129.909 | ppm |
| Mn | 415.834 | 200.610 | ppm |
| Fe | 14740.1 | 391.692 | ppm |
| Ni | 74.2228 | 54.0297 | ppm |
| Cu | 127.347 | 37.7023 | ppm |
| Zn | 329.355 | 37.2411 | ppm |
| Sr | 37.0928 | 6.00620 | ppm |
| Zr | 176.924 | 8.17166 | ppm |
| Pb | 9259.41 | 115.829 | ppm |
| Rb | 31.8069 | 7.45871 | ppm |
| Sn | 361.554 | 37.1626 | ppm |
| Sb | 269.759 | 25.9926 | ppm |
| Ba | 172.851 | 11.3364 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 14:47:57
ID: <HW18 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 715.015 | 241.943 | ppm |
| K | 4629.20 | 357.527 | ppm |
| Ca | 9875.89 | 309.054 | ppm |
| Ti | 1211.77 | 131.220 | ppm |
| Mn | 449.014 | 208.577 | ppm |
| Fe | 14481.3 | 391.746 | ppm |
| Ni | 109.338 | 55.9266 | ppm |
| Cu | 165.675 | 39.9538 | ppm |
| Zn | 373.194 | 39.0478 | ppm |
| Sr | 39.0159 | 6.14970 | ppm |
| Zr | 168.712 | 8.08698 | ppm |
| Pb | 9541.86 | 118.535 | ppm |
| Rb | 28.0252 | 7.43460 | ppm |
| Cd | 129.872 | 59.1190 | ppm |
| Sn | 345.694 | 37.6377 | ppm |
| Sb | 217.401 | 25.7935 | ppm |
| Ba | 172.140 | 11.4419 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 15:06:19
ID: <HW18 DIL>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 5609.34 | 367.363 | ppm |
| Ca | 1831.44 | 156.296 | ppm |
| Ti | 1793.68 | 147.968 | ppm |
| Mn | 230.371 | 182.527 | ppm |
| Fe | 16207.2 | 405.962 | ppm |
| Cu | 36.0765 | 31.8711 | ppm |
| Zn | 201.426 | 32.0747 | ppm |
| Sr | 47.5868 | 5.83390 | ppm |
| Zr | 204.947 | 8.28872 | ppm |
| Pb | 5832.73 | 89.0275 | ppm |
| Rb | 46.6057 | 7.23917 | ppm |
| Sn | 233.475 | 33.3734 | ppm |
| Sb | 217.207 | 23.7524 | ppm |
| Ba | 195.399 | 11.3968 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 15:10:44
ID: <HW18 DIL REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 6323.94 | 388.377 | ppm |
| Ca | 2685.56 | 180.852 | ppm |
| Ti | 1818.74 | 151.339 | ppm |
| Fe | 19695.4 | 449.773 | ppm |
| Co | 170.638 | 160.521 | ppm |
| Ni | 93.7264 | 57.3184 | ppm |
| Cu | 131.408 | 38.4256 | ppm |
| Zn | 201.786 | 33.6667 | ppm |
| Sr | 32.3510 | 5.58037 | ppm |
| Zr | 229.177 | 8.98620 | ppm |
| Hg | 30.7018 | 28.3833 | ppm |
| Pb | 6809.64 | 99.3037 | ppm |
| Rb | 54.9325 | 7.93707 | ppm |
| Sn | 293.967 | 36.5094 | ppm |
| Sb | 229.404 | 25.0377 | ppm |
| Ba | 193.968 | 11.7716 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 15:24:25
ID: <HW19>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3484.81 | 308.293 | ppm |
| Ca | 2625.40 | 173.356 | ppm |
| Ti | 883.102 | 122.149 | ppm |
| Fe | 15582.9 | 399.927 | ppm |
| Co | 262.803 | 151.404 | ppm |
| Ni | 69.3691 | 57.6008 | ppm |
| Cu | 88.6901 | 38.1821 | ppm |
| Zn | 248.888 | 36.9095 | ppm |
| Sr | 34.2750 | 5.93344 | ppm |
| Zr | 75.9482 | 5.96239 | ppm |
| Pb | 8966.59 | 113.562 | ppm |
| Rb | 30.7107 | 7.50104 | ppm |
| Sn | 215.911 | 32.8177 | ppm |
| Sb | 164.389 | 22.5764 | ppm |
| Ba | 98.5886 | 9.06142 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 15:55:07
ID: <4328-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -167.930 | 188.620 | ppm |
| K | 19714.2 | 634.677 | ppm |
| Ca | 2290.75 | 199.817 | ppm |
| Ti | 5001.93 | 232.632 | ppm |
| CrLO | 187.062 | 117.983 | ppm |
| Mn | 1858.28 | 276.324 | ppm |
| Fe | 25916.4 | 525.617 | ppm |
| Co | -53.3502 | 175.916 | ppm |
| Ni | 80.9186 | 55.5227 | ppm |
| Cu | 18.0248 | 31.2504 | ppm |
| Zn | 77.8581 | 27.4896 | ppm |
| As | 44.8991 | 17.8432 | ppm |
| Se | -16.4380 | 11.0667 | ppm |
| Sr | 60.1641 | 5.80111 | ppm |
| Zr | 410.042 | 11.3074 | ppm |
| Mo | 8.64399 | 3.74385 | ppm |
| Hg | -11.0578 | 20.9601 | ppm |
| Pb | -4.59910 | 9.48890 | ppm |
| Rb | 89.2538 | 8.01461 | ppm |
| Cd | 138.808 | 52.7638 | ppm |
| Sn | 36.5131 | 29.0390 | ppm |
| Sb | 0.598349 | 18.9762 | ppm |
| Ba | 243.794 | 12.1670 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 15:59:30
ID: <4500-5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 585.287 | 242.307 | ppm |
| K | 31429.8 | 795.257 | ppm |
| Ca | 3438.38 | 248.327 | ppm |
| Ti | 5925.62 | 249.776 | ppm |
| CrLO | -19.6673 | 114.792 | ppm |
| Mn | 868.983 | 257.813 | ppm |
| Fe | 37302.9 | 651.676 | ppm |
| Co | 586.983 | 226.491 | ppm |
| Ni | -26.2210 | 58.5139 | ppm |
| Cu | 90.0909 | 37.7964 | ppm |
| Zn | 94.3385 | 29.8157 | ppm |
| As | -276.184 | 66.2185 | ppm |
| Se | -8.73038 | 13.7051 | ppm |
| Sr | 59.7321 | 6.40659 | ppm |
| Zr | 377.594 | 11.7073 | ppm |
| Mo | -1.02052 | 3.67060 | ppm |
| Hg | -13.9035 | 23.6123 | ppm |
| Pb | 1710.20 | 52.8626 | ppm |
| Rb | 139.499 | 10.4534 | ppm |
| Cd | 169.729 | 60.2379 | ppm |
| Sn | 47.6499 | 33.1763 | ppm |
| Sb | 18.4679 | 22.0298 | ppm |
| Ba | 456.603 | 17.0799 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 16:23:43
ID: <W23>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 287.802 | 226.536 | ppm |
| K | 7406.94 | 411.344 | ppm |
| Ca | 1333.72 | 146.847 | ppm |
| Ti | 1913.00 | 161.949 | ppm |
| Fe | 26410.8 | 521.577 | ppm |
| Co | 236.970 | 183.716 | ppm |
| Cu | 186.930 | 44.2904 | ppm |
| Zn | 120.402 | 34.6853 | ppm |
| Sr | 41.2227 | 6.07698 | ppm |
| Zr | 130.320 | 7.25103 | ppm |
| Pb | 6438.52 | 98.4956 | ppm |
| Rb | 78.2914 | 8.94033 | ppm |
| Sn | 178.257 | 37.2498 | ppm |
| Sb | 184.215 | 25.8480 | ppm |
| Ba | 145.306 | 10.9524 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 16:29:55
ID: <W24>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 228.248 | 204.762 | ppm |
| K | 7785.18 | 417.520 | ppm |
| Ca | 588.230 | 122.509 | ppm |
| Ti | 1702.25 | 149.410 | ppm |
| CrLO | 130.374 | 103.014 | ppm |
| Fe | 14296.9 | 382.631 | ppm |
| Cu | 130.248 | 38.3394 | ppm |
| Zn | 127.183 | 31.8867 | ppm |
| Se | 38.0470 | 16.2394 | ppm |
| Sr | 40.3114 | 5.43099 | ppm |
| Zr | 143.880 | 6.97347 | ppm |
| Hg | 36.3204 | 27.2152 | ppm |
| Pb | 4402.75 | 76.3072 | ppm |
| Rb | 67.5420 | 7.74790 | ppm |
| Sn | 184.693 | 32.5750 | ppm |
| Sb | 165.858 | 22.7139 | ppm |
| Ba | 131.406 | 9.77218 | ppm |

NLI 002 1349

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 16:36:21
ID: <W11 1" D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2750.91 | 276.457 | ppm |
| Ca | 2548.96 | 166.658 | ppm |
| Ti | 231.405 | 89.2493 | ppm |
| CrLO | 130.956 | 102.435 | ppm |
| Fe | 3688.88 | 202.564 | ppm |
| Zn | 159.643 | 33.3436 | ppm |
| Sr | 16.1095 | 3.92263 | ppm |
| Zr | 27.3053 | 3.52936 | ppm |
| Pb | 2570.91 | 54.2364 | ppm |
| Rb | 5.29401 | 4.78814 | ppm |
| Sn | 77.4342 | 23.7148 | ppm |
| Sb | 36.9217 | 15.2856 | ppm |
| Ba | 24.0328 | 5.33345 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 16:44:27
ID: <W11 4"-5" D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 240.615 | 187.627 | ppm |
| K | 2759.25 | 273.423 | ppm |
| Ca | 948.767 | 118.184 | ppm |
| Ti | 385.112 | 98.0719 | ppm |
| CrLO | 235.777 | 100.483 | ppm |
| Fe | 9370.51 | 306.404 | ppm |
| Zn | 174.801 | 32.4691 | ppm |
| As | 105.485 | 67.2949 | ppm |
| Sr | 10.2743 | 3.55951 | ppm |
| Zr | 47.0633 | 4.11630 | ppm |
| Mo | 3.81469 | 2.40362 | ppm |
| Pb | 2084.13 | 50.0105 | ppm |
| Rb | 15.9120 | 5.13314 | ppm |
| Sn | 63.7525 | 23.4044 | ppm |
| Sb | 46.8773 | 15.0079 | ppm |
| Ba | 30.8581 | 5.58428 | ppm |

NLI 002 1350

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 16:50:11
ID: <W25>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 7096.35 | 399.527 | ppm |
| Ca | 187.963 | 104.555 | ppm |
| Ti | 1938.25 | 159.396 | ppm |
| CrLO | 172.999 | 99.4419 | ppm |
| Mn | 273.211 | 181.527 | ppm |
| Fe | 17482.4 | 418.906 | ppm |
| Zn | 114.098 | 28.9578 | ppm |
| Sr | 46.7073 | 5.36672 | ppm |
| Zr | 121.409 | 6.32954 | ppm |
| Hg | 35.6312 | 24.5918 | ppm |
| Pb | 2618.70 | 58.5941 | ppm |
| Rb | 66.5850 | 7.32558 | ppm |
| Sn | 111.481 | 29.0200 | ppm |
| Sb | 170.829 | 20.8846 | ppm |
| Ba | 143.906 | 9.69129 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 16:56:12
ID: <W25 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4734.82 | 337.696 | ppm |
| Ca | 857.455 | 122.149 | ppm |
| Ti | 1168.07 | 138.898 | ppm |
| CrLO | 157.814 | 105.681 | ppm |
| Fe | 14595.2 | 383.845 | ppm |
| Zn | 113.808 | 34.7556 | ppm |
| Sr | 41.3414 | 5.35950 | ppm |
| Zr | 109.382 | 6.13922 | ppm |
| Pb | 3114.97 | 63.3094 | ppm |
| Rb | 53.0279 | 7.17623 | ppm |
| Sn | 163.551 | 30.9284 | ppm |
| Sb | 57.1711 | 19.4029 | ppm |
| Ba | 125.035 | 9.32507 | ppm |

NLI 002 1351

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 17:05:47
ID: <HW20>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3294.89 | 302.471 | ppm |
| Ca | 2789.10 | 177.147 | ppm |
| Ti | 935.768 | 118.378 | ppm |
| Fe | 16660.9 | 413.662 | ppm |
| Ni | 58.3427 | 56.3696 | ppm |
| Cu | 104.886 | 39.3084 | ppm |
| Zn | 188.116 | 35.3796 | ppm |
| Sr | 45.5957 | 6.42298 | ppm |
| Zr | 106.942 | 6.82020 | ppm |
| Pb | 9403.47 | 117.059 | ppm |
| Rb | 39.2965 | 7.90251 | ppm |
| Sn | 353.168 | 37.2489 | ppm |
| Sb | 319.525 | 26.9138 | ppm |
| Ba | 79.1297 | 8.85253 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 17:09:52
ID: <HW20 REP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 373.460 | 219.924 | ppm |
| K | 3135.14 | 296.768 | ppm |
| Ca | 1953.01 | 155.068 | ppm |
| Ti | 1025.84 | 130.263 | ppm |
| Fe | 15738.7 | 404.251 | ppm |
| Cu | 169.700 | 42.9730 | ppm |
| Zn | 144.381 | 35.1719 | ppm |
| Sr | 41.4008 | 6.53977 | ppm |
| Zr | 117.792 | 7.22182 | ppm |
| Pb | 10761.4 | 126.646 | ppm |
| Rb | 40.7999 | 8.23873 | ppm |
| Sn | 526.938 | 40.7283 | ppm |
| Sb | 349.526 | 27.9958 | ppm |
| Ba | 97.9911 | 9.61462 | ppm |

NLI 002 1352

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 17:15:29
ID: <HW22>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4370.56 | 331.549 | ppm |
| Ca | 1313.44 | 137.622 | ppm |
| Ti | 1066.05 | 136.712 | ppm |
| Fe | 25639.6 | 510.184 | ppm |
| Co | 297.366 | 182.037 | ppm |
| Zn | 98.1016 | 33.3394 | ppm |
| Sr | 38.8045 | 5.95061 | ppm |
| Zr | 132.749 | 7.27472 | ppm |
| Pb | 6776.85 | 100.431 | ppm |
| Rb | 64.5647 | 8.49314 | ppm |
| Sn | 333.629 | 36.4867 | ppm |
| Sb | 314.091 | 26.4026 | ppm |
| Ba | 99.2397 | 9.34217 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 17:25:35
ID: <W26>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 5103.46 | 352.944 | ppm |
| Ca | 2174.30 | 164.557 | ppm |
| Ti | 1672.81 | 150.695 | ppm |
| Fe | 15926.4 | 404.759 | ppm |
| Zn | 74.2485 | 35.4977 | ppm |
| Sr | 37.1578 | 5.73204 | ppm |
| Zr | 97.2296 | 6.24562 | ppm |
| Pb | 6014.06 | 90.5179 | ppm |
| Rb | 31.0568 | 7.15305 | ppm |
| Cd | 106.203 | 62.7154 | ppm |
| Sn | 301.005 | 38.3969 | ppm |
| Sb | 163.121 | 25.5909 | ppm |
| Ba | 97.0780 | 9.54766 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 17:33:29
ID: <4328-5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 78.3353 | 181.646 | ppm |
| K | 15490.6 | 566.531 | ppm |
| Ca | 1625.75 | 173.733 | ppm |
| Ti | 4041.27 | 205.903 | ppm |
| CrLO | -94.9649 | 95.6642 | ppm |
| Mn | 1309.54 | 241.533 | ppm |
| Fe | 21456.2 | 471.842 | ppm |
| Co | 38.9301 | 161.106 | ppm |
| Ni | -0.119397 | 47.2385 | ppm |
| Cu | 11.0942 | 28.4911 | ppm |
| Zn | 131.252 | 28.0088 | ppm |
| As | 33.3084 | 16.2666 | ppm |
| Se | -32.6244 | 9.31753 | ppm |
| Sr | 34.4890 | 4.56303 | ppm |
| Zr | 338.858 | 9.98039 | ppm |
| Mo | -0.0377878 | 3.14538 | ppm |
| Hg | -3.08935 | 19.7394 | ppm |
| Pb | -0.961647 | 8.88327 | ppm |
| Rb | 69.0022 | 7.02658 | ppm |
| Cd | -90.5924 | 44.3336 | ppm |
| Sn | -6.33202 | 25.3345 | ppm |
| Sb | 29.8139 | 16.7209 | ppm |
| Ba | 189.424 | 10.5429 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 17:37:59
ID: <4500-6>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| CrHI | 249.013 | 212.990 ppm |
| K | 30087.5 | 779.241 ppm |
| Ca | 4290.57 | 261.092 ppm |
| Ti | 6365.29 | 252.471 ppm |
| Mn | 447.087 | 233.735 ppm |
| Fe | 39040.6 | 665.084 ppm |
| Ni | 68.1320 | 58.7625 ppm |
| Zn | 124.243 | 31.0148 ppm |
| Sr | 57.6465 | 6.31103 ppm |
| Zr | 367.297 | 11.5413 ppm |
| Pb | 1742.10 | 53.2657 ppm |
| Rb | 131.802 | 10.2290 ppm |
| Cd | 64.6278 | 60.5600 ppm |
| Sn | 57.4726 | 34.2117 ppm |
| Sb | 60.3962 | 23.0638 ppm |
| Ba | 431.655 | 16.7627 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 17:43:19
ID: <HW22 DIL>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3658.28 | 305.975 ppm |
| Ca | 892.352 | 119.956 ppm |
| Ti | 1609.03 | 139.905 ppm |
| Fe | 15631.4 | 394.953 ppm |
| Zn | 71.7099 | 31.3206 ppm |
| Sr | 39.1879 | 5.10734 ppm |
| Zr | 259.051 | 8.76340 ppm |
| Pb | 2570.99 | 57.3230 ppm |
| Rb | 56.2703 | 7.07665 ppm |
| Cd | 60.6952 | 52.6779 ppm |
| Sn | 208.630 | 32.1177 ppm |
| Sb | 113.158 | 21.2874 ppm |
| Ba | 106.519 | 8.92740 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 17:58:55
ID: <W27>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 509.801 | 220.337 | ppm |
| K | 4152.75 | 321.134 | ppm |
| Ca | 931.566 | 123.007 | ppm |
| Ti | 1836.25 | 140.508 | ppm |
| CrLO | 334.626 | 103.296 | ppm |
| Fe | 26775.6 | 518.851 | ppm |
| Zn | 193.512 | 37.8974 | ppm |
| Sr | 36.5659 | 5.42043 | ppm |
| Zr | 124.382 | 6.75155 | ppm |
| Mo | 7.36500 | 3.22746 | ppm |
| Pb | 3211.99 | 67.6087 | ppm |
| Rb | 26.4548 | 6.55944 | ppm |
| Sn | 264.870 | 33.1914 | ppm |
| Sb | 139.376 | 21.6138 | ppm |
| Ba | 58.4017 | 7.66303 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 18:04:22
ID: <W28>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 5936.42 | 369.294 | ppm |
| Ca | 722.796 | 121.001 | ppm |
| Ti | 2007.21 | 159.959 | ppm |
| Fe | 32701.7 | 575.084 | ppm |
| Co | 366.601 | 202.988 | ppm |
| Zn | 131.826 | 39.0967 | ppm |
| Se | 40.0499 | 17.5135 | ppm |
| Sr | 25.1185 | 4.95384 | ppm |
| Zr | 88.4996 | 5.89275 | ppm |
| Mo | 5.23077 | 3.18649 | ppm |
| Hg | 67.9726 | 32.2855 | ppm |
| Pb | 1630.41 | 49.3144 | ppm |
| Rb | 47.5293 | 7.34948 | ppm |
| Cd | 155.406 | 62.0964 | ppm |
| Sn | 393.409 | 39.0757 | ppm |
| Sb | 218.342 | 26.3242 | ppm |
| Ba | 83.2148 | 9.07626 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 25-JUN-1992 18:09:26
ID: <W29>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3175.18 | 287.180 | ppm |
| Ca | 659.326 | 108.530 | ppm |
| Ti | 894.949 | 114.335 | ppm |
| CrLO | 256.255 | 97.3323 | ppm |
| Fe | 9766.87 | 311.791 | ppm |
| Cu | 54.2792 | 33.1188 | ppm |
| Zn | 141.630 | 31.4043 | ppm |
| Sr | 26.8295 | 4.16893 | ppm |
| Zr | 58.6068 | 4.40579 | ppm |
| Mo | 7.55921 | 2.52608 | ppm |
| Pb | 1108.10 | 36.6989 | ppm |
| Rb | 21.8353 | 5.15089 | ppm |
| Sn | 103.905 | 25.1940 | ppm |
| Sb | 38.4213 | 15.5262 | ppm |
| Ba | 65.4339 | 6.89968 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 08:31:13
ID: <ECAL>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 2333.21 | 570.653 | ppm |
| K | 1316.46 | 252.790 | ppm |
| Ca | 10561.2 | 294.500 | ppm |
| CrLO | 176.996 | 126.238 | ppm |
| Mn | 962.314 | 437.432 | ppm |
| Ni | 321.085 | 121.560 | ppm |
| Hg | 533.555 | 112.698 | ppm |
| Pb | 178763 | 1283.64 | ppm |
| Cd | 585.854 | 102.065 | ppm |
| Sn | 406.794 | 69.3016 | ppm |
| Sb | 141.113 | 44.8893 | ppm |
| Ba | 81.0596 | 16.5214 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 09:05:28
ID: <RESCHK>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 120.254 | 67.4802 | ppm |
| K | 1034.32 | 191.736 | ppm |
| Ca | 143.299 | 73.1670 | ppm |
| Fe | 1.55121e+06 | 7483.48 | ppm |
| Ni | 1801.89 | 1010.87 | ppm |
| Sr | 40.1844 | 24.4466 | ppm |
| Mo | 27.0363 | 13.2472 | ppm |
| Cd | 1354.07 | 342.757 | ppm |
| Sn | 370.207 | 186.912 | ppm |
| Sb | 303.529 | 129.170 | ppm |
| Ba | 46.6702 | 32.5078 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 09:32:49
ID: <D4328>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -389.069 | 167.810 | ppm |
| K | 18409.4 | 614.449 | ppm |
| Ca | 2150.94 | 193.580 | ppm |
| Ti | 4975.80 | 227.019 | ppm |
| CrLO | 78.4324 | 110.468 | ppm |
| Mn | 2041.61 | 279.133 | ppm |
| Fe | 25175.4 | 516.277 | ppm |
| Co | 175.679 | 178.687 | ppm |
| Ni | -9.83841 | 50.3758 | ppm |
| Cu | -11.4329 | 28.9535 | ppm |
| Zn | 53.7586 | 26.1375 | ppm |
| As | -0.245054 | 16.2706 | ppm |
| Se | 1.10326 | 11.8570 | ppm |
| Sr | 49.2204 | 5.34600 | ppm |
| Zr | 380.749 | 10.8295 | ppm |
| Mo | -4.65305 | 3.25695 | ppm |
| Hg | -3.96231 | 21.0575 | ppm |
| Pb | 0.550166 | 9.94911 | ppm |
| Rb | 76.3234 | 7.52011 | ppm |
| Cd | 50.1036 | 51.4868 | ppm |
| Sn | -22.8958 | 27.8990 | ppm |
| Sb | 0.0869424 | 18.5007 | ppm |
| Ba | 231.790 | 11.8374 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 09:35:59
ID: <D4330>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 270.691 | 236.525 | ppm |
| K | 10185.4 | 501.778 | ppm |
| Ca | 35199.3 | 558.634 | ppm |
| Ti | 985.793 | 138.723 | ppm |
| Mn | 1455.82 | 362.869 | ppm |
| Fe | 164347 | 1455.30 | ppm |
| Cu | 216.555 | 58.6539 | ppm |
| Zn | 304.512 | 48.4039 | ppm |
| As | 125.379 | 36.8909 | ppm |
| Sr | 53.1411 | 8.06328 | ppm |
| Zr | 85.5867 | 7.98004 | ppm |
| Pb | 104.363 | 23.9642 | ppm |
| Rb | 62.0843 | 10.6508 | ppm |
| Cd | 194.546 | 83.8886 | ppm |
| Sn | 87.0371 | 46.4770 | ppm |
| Ba | 81.7668 | 11.4870 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 09:50:12
ID: <C4327>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 17961.7 | 611.679 | ppm |
| Ca | 6035.96 | 267.902 | ppm |
| Ti | 4395.69 | 223.081 | ppm |
| CrLO | 202.496 | 117.382 | ppm |
| Mn | 694.727 | 227.281 | ppm |
| Fe | 29366.4 | 559.885 | ppm |
| Ni | 140.573 | 59.3058 | ppm |
| Cu | 76.8511 | 35.7478 | ppm |
| Zn | 149.821 | 31.6244 | ppm |
| Sr | 61.1948 | 6.09611 | ppm |
| Zr | 403.153 | 11.4800 | ppm |
| Hg | 35.4408 | 25.0300 | ppm |
| Pb | 1103.52 | 40.7409 | ppm |
| Rb | 70.7153 | 7.71062 | ppm |
| Sb | 36.7538 | 18.1233 | ppm |
| Ba | 168.495 | 10.4887 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 09:54:01
ID: <4497>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 299.511 | 232.467 | ppm |
| K | 20753.6 | 670.527 | ppm |
| Ca | 11501.0 | 357.647 | ppm |
| Ti | 4200.09 | 223.147 | ppm |
| Mn | 605.098 | 243.460 | ppm |
| Fe | 30516.0 | 588.281 | ppm |
| Cu | 50.5639 | 37.7179 | ppm |
| Zn | 131.240 | 33.2863 | ppm |
| Sr | 123.067 | 9.53201 | ppm |
| Zr | 328.441 | 11.9073 | ppm |
| Pb | 10639.0 | 137.462 | ppm |
| Rb | 65.3390 | 9.63631 | ppm |
| Sb | 74.4098 | 22.5440 | ppm |
| Ba | 220.109 | 13.0884 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 12:53:39
ID: <D4328-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -402.221 | 180.320 | ppm |
| K | 19344.4 | 629.091 | ppm |
| Ca | 2437.53 | 202.122 | ppm |
| Ti | 4568.31 | 227.347 | ppm |
| CrLO | -52.6089 | 109.336 | ppm |
| Mn | 2245.74 | 289.986 | ppm |
| Fe | 24956.4 | 515.094 | ppm |
| Co | -84.2047 | 172.090 | ppm |
| Ni | 31.8080 | 51.8272 | ppm |
| Cu | 20.9727 | 31.0422 | ppm |
| Zn | 103.280 | 28.4656 | ppm |
| As | 1.17992 | 17.4303 | ppm |
| Se | -24.1322 | 10.5708 | ppm |
| Sr | 65.1982 | 5.96938 | ppm |
| Zr | 400.158 | 11.1388 | ppm |
| Mo | 1.81663 | 3.50712 | ppm |
| Hg | 15.7733 | 22.2695 | ppm |
| Pb | 18.3986 | 10.8452 | ppm |
| Rb | 81.3379 | 7.70660 | ppm |
| Cd | 80.2206 | 51.6538 | ppm |
| Sn | 51.6799 | 29.0916 | ppm |
| Sb | 25.3884 | 19.1536 | ppm |
| Ba | 230.370 | 11.8329 | ppm |

NLI 002 1362

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 13:00:24
ID: <C4327-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 18904.5 | 625.944 | ppm |
| Ca | 5583.90 | 261.985 | ppm |
| Ti | 4787.32 | 225.224 | ppm |
| Mn | 416.402 | 215.984 | ppm |
| Fe | 30327.9 | 569.830 | ppm |
| Ni | 85.0894 | 58.2899 | ppm |
| Zn | 136.094 | 31.0061 | ppm |
| Sr | 73.3051 | 6.54059 | ppm |
| Zr | 407.496 | 11.5954 | ppm |
| Mo | 6.32314 | 3.79883 | ppm |
| Pb | 1109.93 | 40.9721 | ppm |
| Rb | 66.4031 | 7.58456 | ppm |
| Sn | 105.335 | 28.5115 | ppm |
| Ba | 191.106 | 11.0619 | ppm |

NLI 002 1363

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 13:06:28
ID: <D4328-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 56.4441 | 203.943 | ppm |
| K | 18735.9 | 619.994 | ppm |
| Ca | 2731.74 | 207.216 | ppm |
| Ti | 5063.20 | 230.034 | ppm |
| CrLO | -48.4217 | 107.189 | ppm |
| Mn | 1806.57 | 274.092 | ppm |
| Fe | 25489.6 | 520.999 | ppm |
| Co | 400.446 | 185.166 | ppm |
| Ni | 69.7716 | 56.4880 | ppm |
| Cu | 29.0622 | 31.7542 | ppm |
| Zn | 69.1157 | 26.9091 | ppm |
| As | 36.9527 | 17.3551 | ppm |
| Se | -14.2667 | 11.1133 | ppm |
| Sr | 45.5225 | 5.21004 | ppm |
| Zr | 366.861 | 10.6752 | ppm |
| Mo | 2.56784 | 3.44257 | ppm |
| Hg | -20.0828 | 20.1268 | ppm |
| Pb | -5.49896 | 9.39563 | ppm |
| Rb | 87.5246 | 7.94082 | ppm |
| Cd | 64.7870 | 51.7912 | ppm |
| Sn | 40.4235 | 29.0626 | ppm |
| Sb | 9.74134 | 18.8393 | ppm |
| Ba | 229.757 | 11.8474 | ppm |

NLI 002 1364

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 13:10:30
ID: <C4327-3>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 20673.7 | 652.691 ppm |
| Ca | 6338.84 | 277.573 ppm |
| Ti | 4472.07 | 228.803 ppm |
| Mn | 1036.30 | 248.552 ppm |
| Fe | 32160.6 | 589.536 ppm |
| Cu | 84.7076 | 36.5576 ppm |
| Zn | 115.205 | 30.7350 ppm |
| Sr | 64.2745 | 6.28278 ppm |
| Zr | 447.811 | 12.2349 ppm |
| Hg | 25.3665 | 25.0259 ppm |
| Pb | 952.291 | 38.5486 ppm |
| Rb | 93.3401 | 8.59136 ppm |
| Sn | 28.9362 | 27.5904 ppm |
| Sb | 33.2778 | 18.2019 ppm |
| Ba | 184.363 | 10.9855 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:07:41
ID: <2B>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 8005.93 | 422.764 ppm |
| Ca | 2357.83 | 174.849 ppm |
| Ti | 3146.53 | 192.609 ppm |
| Fe | 9989.94 | 317.710 ppm |
| Zn | 125.200 | 26.2237 ppm |
| As | 59.2437 | 40.9594 ppm |
| Sr | 30.5327 | 4.20386 ppm |
| Zr | 181.966 | 7.04047 ppm |
| Mo | 4.37076 | 2.61631 ppm |
| Hg | 39.2589 | 21.0936 ppm |
| Pb | 693.014 | 29.6595 ppm |
| Rb | 46.1709 | 5.86613 ppm |
| Sn | 40.1735 | 16.6563 ppm |
| Sb | 15.5781 | 10.3821 ppm |
| Ba | 25.1726 | 4.42910 ppm |

NLI 002 1365

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:11:19
ID: <2C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 6162.63 | 377.112 | ppm |
| Ca | 1844.77 | 156.801 | ppm |
| Ti | 2989.86 | 183.585 | ppm |
| Fe | 7761.20 | 280.053 | ppm |
| Zn | 153.246 | 27.4039 | ppm |
| As | 41.1236 | 35.7875 | ppm |
| Sr | 22.5571 | 3.71629 | ppm |
| Zr | 148.894 | 6.29748 | ppm |
| Mo | 4.65873 | 2.48496 | ppm |
| Pb | 522.066 | 25.6068 | ppm |
| Rb | 27.6093 | 4.97668 | ppm |
| Sn | 28.4592 | 16.1069 | ppm |
| Sb | 31.9468 | 10.8924 | ppm |
| Ba | 14.1318 | 3.80722 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:14:46
ID: <3B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3865.84 | 311.223 | ppm |
| Ca | 911.988 | 121.103 | ppm |
| Ti | 2543.98 | 162.412 | ppm |
| CrLO | 274.723 | 96.1780 | ppm |
| Fe | 3250.97 | 186.641 | ppm |
| Ni | 51.1522 | 42.2017 | ppm |
| Sr | 19.1881 | 3.36158 | ppm |
| Zr | 168.939 | 6.42665 | ppm |
| Pb | 32.3977 | 9.87881 | ppm |
| Rb | 12.3151 | 3.96011 | ppm |
| Cd | 90.7349 | 42.4057 | ppm |
| Sn | 34.5329 | 23.6587 | ppm |
| Ba | 76.9462 | 7.12100 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:18:38
ID: <4B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 16649.5 | 590.913 | ppm |
| Ca | 6161.40 | 267.606 | ppm |
| Ti | 4074.29 | 220.298 | ppm |
| Fe | 34231.6 | 602.565 | ppm |
| Zn | 365.913 | 38.6250 | ppm |
| Sr | 65.7713 | 6.27765 | ppm |
| Zr | 297.933 | 10.0382 | ppm |
| Pb | 1041.06 | 40.1046 | ppm |
| Rb | 78.8250 | 8.02653 | ppm |
| Sn | 70.9944 | 23.0715 | ppm |
| Sb | 43.1348 | 15.0081 | ppm |
| Ba | 117.158 | 8.73163 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:22:13
ID: <5B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 3833.14 | 310.552 | ppm |
| Ca | 1100.19 | 127.363 | ppm |
| Ti | 2684.54 | 160.313 | ppm |
| CrLO | 202.844 | 90.0080 | ppm |
| Fe | 4224.64 | 209.398 | ppm |
| Co | 132.980 | 92.0265 | ppm |
| As | 27.7747 | 15.6002 | ppm |
| Sr | 7.93523 | 2.78874 | ppm |
| Zr | 225.799 | 7.38637 | ppm |
| Mo | 6.83290 | 2.70655 | ppm |
| Hg | 24.8091 | 19.2039 | ppm |
| Pb | 12.1864 | 8.85184 | ppm |
| Rb | 7.52016 | 3.71048 | ppm |
| Sb | 28.8773 | 15.5927 | ppm |
| Ba | 33.6719 | 5.76939 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:26:27
ID: <2D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 8080.40 | 424.470 | ppm |
| Ca | 2512.35 | 178.785 | ppm |
| Ti | 3466.74 | 195.392 | ppm |
| Fe | 13004.5 | 361.127 | ppm |
| Cu | 54.0404 | 29.1992 | ppm |
| Zn | 108.768 | 25.9561 | ppm |
| Sr | 23.9410 | 3.90415 | ppm |
| Zr | 188.853 | 7.21197 | ppm |
| Pb | 650.614 | 29.0844 | ppm |
| Rb | 36.3229 | 5.52497 | ppm |
| Sb | 24.6245 | 10.5531 | ppm |
| Ba | 23.6015 | 4.37183 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:29:56
ID: <3C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 4576.61 | 332.997 | ppm |
| Ca | 910.030 | 123.842 | ppm |
| Ti | 3576.29 | 188.253 | ppm |
| Fe | 3798.03 | 201.525 | ppm |
| Ni | 66.8066 | 43.9795 | ppm |
| Zn | 47.0808 | 23.0626 | ppm |
| As | 23.4875 | 17.1488 | ppm |
| Sr | 19.4577 | 3.43779 | ppm |
| Zr | 262.485 | 7.98414 | ppm |
| Pb | 35.8259 | 10.3271 | ppm |
| Rb | 5.78237 | 3.66894 | ppm |
| Cd | 102.375 | 43.4306 | ppm |
| Sn | 25.8291 | 23.9900 | ppm |
| Ba | 49.9864 | 6.40226 | ppm |

NLI 002 1368

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:33:54
ID: <3D>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 3804.84 | 309.255 ppm |
| Ca | 1024.92 | 124.627 ppm |
| Ti | 2453.68 | 156.979 ppm |
| Mn | 172.412 | 156.398 ppm |
| Fe | 3840.84 | 201.452 ppm |
| Ni | 67.8610 | 43.3564 ppm |
| Zn | 86.6315 | 24.4467 ppm |
| As | 17.7731 | 16.6917 ppm |
| Sr | 11.4412 | 2.95287 ppm |
| Zr | 242.291 | 7.63668 ppm |
| Pb | 37.3334 | 10.0282 ppm |
| Rb | 4.11467 | 3.52136 ppm |
| Cd | 51.1292 | 42.6491 ppm |
| Ba | 62.2867 | 6.74913 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:37:33
ID: <1B>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| CrHI | 487.571 | 208.695 ppm |
| K | 9491.28 | 455.411 ppm |
| Ca | 2286.29 | 176.701 ppm |
| Ti | 3333.68 | 204.857 ppm |
| CrLO | 129.227 | 109.643 ppm |
| Fe | 22944.8 | 482.541 ppm |
| Co | 255.702 | 168.988 ppm |
| Cu | 100.524 | 33.8132 ppm |
| Zn | 123.217 | 28.0532 ppm |
| Sr | 31.5779 | 4.48806 ppm |
| Zr | 403.935 | 10.8948 ppm |
| Mo | 5.49103 | 3.50820 ppm |
| Pb | 458.689 | 25.9303 ppm |
| Rb | 30.5420 | 5.56591 ppm |
| Sn | 55.8377 | 23.3849 ppm |
| Sb | 70.4370 | 16.1979 ppm |
| Ba | 81.2569 | 7.45458 ppm |

NLI 002 1369

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:41:25
ID: <1C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 474.614 | 206.525 | ppm |
| K | 11870.4 | 503.499 | ppm |
| Ca | 2759.09 | 193.204 | ppm |
| Ti | 4026.23 | 214.986 | ppm |
| CrLO | 299.684 | 117.159 | ppm |
| Mn | 553.435 | 212.542 | ppm |
| Fe | 25002.0 | 507.388 | ppm |
| Cu | 41.6297 | 31.1225 | ppm |
| Zn | 100.387 | 27.3269 | ppm |
| Sr | 26.3915 | 4.29644 | ppm |
| Zr | 390.541 | 10.8301 | ppm |
| Mo | 15.8813 | 3.79632 | ppm |
| Pb | 385.557 | 24.3492 | ppm |
| Rb | 36.0272 | 5.88080 | ppm |
| Sn | 71.6599 | 23.8649 | ppm |
| Sb | 67.3313 | 15.9279 | ppm |
| Ba | 96.9850 | 7.99383 | ppm |

NLI 002 1370

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:47:58
ID: <D4328-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 425.173 | 220.282 | ppm |
| K | 19681.7 | 634.337 | ppm |
| Ca | 2598.03 | 206.402 | ppm |
| Ti | 4775.50 | 229.355 | ppm |
| CrLO | 126.200 | 115.510 | ppm |
| Mn | 2125.78 | 286.905 | ppm |
| Fe | 24258.8 | 509.421 | ppm |
| Co | 269.387 | 179.053 | ppm |
| Ni | 28.8302 | 53.1099 | ppm |
| Cu | -49.8321 | 26.5085 | ppm |
| Zn | 99.8549 | 28.2167 | ppm |
| As | 29.2598 | 18.1601 | ppm |
| Se | -22.7428 | 10.6584 | ppm |
| Sr | 54.9388 | 5.58502 | ppm |
| Zr | 377.383 | 10.8191 | ppm |
| Mo | -4.91288 | 3.24685 | ppm |
| Hg | -5.90940 | 21.1313 | ppm |
| Pb | 12.0439 | 10.4767 | ppm |
| Rb | 102.126 | 8.40574 | ppm |
| Cd | 135.036 | 52.9356 | ppm |
| Sn | 0.768078 | 28.5506 | ppm |
| Sb | 5.57127 | 19.1472 | ppm |
| Ba | 233.904 | 11.9324 | ppm |

NLI 002 1371

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:52:39
ID: <C4327-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 19977.6 | 642.312 | ppm |
| Ca | 6015.46 | 271.051 | ppm |
| Ti | 4451.23 | 224.569 | ppm |
| CrLO | 115.793 | 115.403 | ppm |
| Mn | 1133.46 | 251.388 | ppm |
| Fe | 30752.1 | 575.637 | ppm |
| Zn | 142.797 | 31.4982 | ppm |
| Sr | 71.2419 | 6.47551 | ppm |
| Zr | 419.264 | 11.7986 | ppm |
| Pb | 1108.18 | 41.1120 | ppm |
| Rb | 91.6814 | 8.49946 | ppm |
| Sb | 43.5636 | 17.9024 | ppm |
| Ba | 186.261 | 10.9735 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:54:22
ID: <1D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 463.354 | 210.473 | ppm |
| K | 13329.9 | 531.760 | ppm |
| Ca | 3282.34 | 208.297 | ppm |
| Ti | 4925.53 | 238.009 | ppm |
| CrLO | 269.129 | 122.711 | ppm |
| Fe | 29738.4 | 557.103 | ppm |
| Cu | 113.426 | 36.4408 | ppm |
| Zn | 241.704 | 34.3129 | ppm |
| Sr | 46.0408 | 5.34012 | ppm |
| Zr | 445.201 | 11.8502 | ppm |
| Mo | 20.9306 | 4.17793 | ppm |
| Pb | 576.004 | 29.8541 | ppm |
| Rb | 45.6171 | 6.53234 | ppm |
| Sb | 67.0637 | 17.5815 | ppm |
| Ba | 87.8513 | 8.02808 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 14:58:11
ID: <4D DUP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 17190.8 | 599.643 | ppm |
| Ca | 5944.76 | 265.245 | ppm |
| Ti | 4974.16 | 237.090 | ppm |
| CrLO | 213.528 | 120.688 | ppm |
| Fe | 32559.0 | 588.746 | ppm |
| Zn | 399.049 | 39.7997 | ppm |
| Sr | 64.6232 | 6.20495 | ppm |
| Zr | 377.049 | 11.1771 | ppm |
| Pb | 964.124 | 38.5191 | ppm |
| Rb | 74.3442 | 7.82847 | ppm |
| Cd | 62.4984 | 38.6276 | ppm |
| Sn | 46.3301 | 22.4113 | ppm |
| Sb | 18.1003 | 14.5079 | ppm |
| Ba | 130.929 | 9.10914 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 15:02:49
ID: <5C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 2712.94 | 272.550 | ppm |
| Ca | 650.644 | 107.657 | ppm |
| Ti | 1926.73 | 159.874 | ppm |
| Mn | 171.596 | 159.481 | ppm |
| Fe | 4409.05 | 213.354 | ppm |
| Zn | 23.7129 | 21.2712 | ppm |
| Sr | 11.3627 | 2.97283 | ppm |
| Zr | 348.025 | 9.08956 | ppm |
| Mo | 3.98691 | 2.95591 | ppm |
| Pb | 41.6625 | 10.3220 | ppm |
| Cd | 76.7472 | 37.0560 | ppm |
| Ba | 25.2429 | 5.02872 | ppm |

NLI 002 1373

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 15:14:38
ID: <5D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 461.045 | 205.778 | ppm |
| K | 5354.42 | 357.208 | ppm |
| Ca | 1642.55 | 150.017 | ppm |
| Ti | 5473.26 | 225.671 | ppm |
| Fe | 9688.72 | 313.384 | ppm |
| Ni | 118.141 | 49.1405 | ppm |
| Cu | 70.4444 | 30.9724 | ppm |
| Zn | 100.902 | 26.3013 | ppm |
| As | 68.4662 | 19.4673 | ppm |
| Sr | 7.82081 | 2.94532 | ppm |
| Zr | 301.353 | 8.80173 | ppm |
| Pb | 39.7737 | 10.9467 | ppm |
| Rb | 15.8045 | 4.40763 | ppm |
| Sb | 25.7037 | 16.0127 | ppm |
| Ba | 30.0999 | 5.78450 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 15:18:34
ID: <4C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 266.669 | 194.451 | ppm |
| K | 17311.3 | 601.193 | ppm |
| Ca | 5807.10 | 262.859 | ppm |
| Ti | 4090.05 | 220.681 | ppm |
| Fe | 33810.1 | 599.608 | ppm |
| Zn | 465.031 | 42.0297 | ppm |
| Sr | 70.6491 | 6.44657 | ppm |
| Zr | 274.431 | 9.66118 | ppm |
| Pb | 983.680 | 38.9681 | ppm |
| Rb | 77.8017 | 7.98598 | ppm |
| Sn | 33.4734 | 22.3870 | ppm |
| Sb | 65.1776 | 15.6243 | ppm |
| Ba | 122.007 | 8.87939 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 15:22:03
ID: <4D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 17878.4 | 609.334 | ppm |
| Ca | 4869.50 | 247.485 | ppm |
| Ti | 4102.60 | 216.169 | ppm |
| CrLO | 236.055 | 114.997 | ppm |
| Fe | 33732.8 | 598.614 | ppm |
| Ni | 136.884 | 59.8002 | ppm |
| Zn | 397.436 | 39.6725 | ppm |
| Sr | 61.5580 | 6.11626 | ppm |
| Zr | 304.025 | 10.1087 | ppm |
| Hg | 28.8378 | 23.8932 | ppm |
| Pb | 946.000 | 38.1773 | ppm |
| Rb | 79.9254 | 8.03736 | ppm |
| Ba | 117.403 | 8.68092 | ppm |

NLI 002 1375

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 15:25:43
ID: <D4328-5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -250.879 | 170.515 | ppm |
| K | 19853.4 | 636.481 | ppm |
| Ca | 1941.68 | 192.098 | ppm |
| Ti | 5115.32 | 231.744 | ppm |
| CrLO | -266.486 | 100.138 | ppm |
| Mn | 1754.01 | 267.816 | ppm |
| Fe | 25372.9 | 519.458 | ppm |
| Co | -273.932 | 168.476 | ppm |
| Ni | 71.1309 | 53.3651 | ppm |
| Cu | 32.7819 | 31.8110 | ppm |
| Zn | 59.4011 | 26.5366 | ppm |
| As | 16.5564 | 17.8176 | ppm |
| Se | 2.65147 | 11.9666 | ppm |
| Sr | 43.7188 | 5.16553 | ppm |
| Zr | 364.523 | 10.6152 | ppm |
| Mo | 0.444848 | 3.36739 | ppm |
| Hg | 58.2685 | 24.5141 | ppm |
| Pb | 12.2142 | 10.7813 | ppm |
| Rb | 99.3233 | 8.31543 | ppm |
| Cd | 151.653 | 53.2662 | ppm |
| Sn | 24.2518 | 29.0152 | ppm |
| Sb | -4.82265 | 19.0319 | ppm |
| Ba | 237.054 | 12.0271 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 15:29:21
ID: <D4328-6>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 30.8985 | 194.527 | ppm |
| K | 20443.8 | 645.369 | ppm |
| Ca | 2070.95 | 196.347 | ppm |
| Ti | 4811.31 | 229.088 | ppm |
| CrLO | 89.0335 | 113.323 | ppm |
| Mn | 2213.65 | 288.840 | ppm |
| Fe | 25389.8 | 520.929 | ppm |
| Co | 69.8768 | 177.767 | ppm |
| Ni | 62.1365 | 54.7161 | ppm |
| Cu | 6.22985 | 30.5658 | ppm |
| Zn | 103.240 | 28.7084 | ppm |
| As | 0.952357 | 17.7530 | ppm |
| Se | -23.9057 | 10.7083 | ppm |
| Sr | 46.0145 | 5.24920 | ppm |
| Zr | 385.909 | 10.9544 | ppm |
| Mo | -6.56847 | 3.23806 | ppm |
| Hg | -4.62600 | 21.3491 | ppm |
| Pb | 20.6517 | 11.0676 | ppm |
| Rb | 83.0268 | 7.80176 | ppm |
| Cd | 35.1857 | 52.0786 | ppm |
| Sn | -8.98781 | 28.5765 | ppm |
| Sb | 18.1725 | 19.1267 | ppm |
| Ba | 231.847 | 11.9166 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 15:35:35
ID: <D4328-7>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -13.9974 | 193.539 | ppm |
| K | 20214.8 | 642.203 | ppm |
| Ca | 2457.22 | 204.424 | ppm |
| Ti | 4850.70 | 229.736 | ppm |
| CrLO | -130.203 | 106.552 | ppm |
| Mn | 1429.36 | 257.724 | ppm |
| Fe | 25505.7 | 521.217 | ppm |
| Co | -222.260 | 170.041 | ppm |
| Ni | 82.4604 | 54.3143 | ppm |
| Cu | 8.98645 | 30.4109 | ppm |
| Zn | 118.558 | 29.1682 | ppm |
| As | 12.4929 | 18.6079 | ppm |
| Se | 13.3568 | 12.4792 | ppm |
| Sr | 46.3488 | 5.28070 | ppm |
| Zr | 372.148 | 10.7410 | ppm |
| Mo | 1.63717 | 3.42694 | ppm |
| Hg | 61.6651 | 24.7152 | ppm |
| Pb | 26.2435 | 11.7297 | ppm |
| Rb | 90.2466 | 8.02513 | ppm |
| Cd | 17.8489 | 51.9545 | ppm |
| Sn | -11.9159 | 28.5934 | ppm |
| Sb | 41.9212 | 19.6180 | ppm |
| Ba | 238.013 | 12.0554 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 17:03:15
ID: <D4328-8>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 389.189 | 222.754 | ppm |
| K | 19048.0 | 624.604 | ppm |
| Ca | 2509.81 | 203.021 | ppm |
| Ti | 4933.83 | 226.686 | ppm |
| CrLO | 9.26409 | 108.476 | ppm |
| Mn | 1915.16 | 279.963 | ppm |
| Fe | 24273.5 | 508.939 | ppm |
| Co | 45.8897 | 173.337 | ppm |
| Ni | -7.25193 | 49.7724 | ppm |
| Cu | 35.7184 | 31.8617 | ppm |
| Zn | 110.752 | 28.8048 | ppm |
| As | 0.915451 | 17.7719 | ppm |
| Se | -8.95019 | 11.3726 | ppm |
| Sr | 29.5985 | 4.49149 | ppm |
| Zr | 399.164 | 11.0556 | ppm |
| Mo | -6.25011 | 3.26578 | ppm |
| Hg | -9.23588 | 20.8634 | ppm |
| Pb | 22.3966 | 11.2350 | ppm |
| Rb | 94.9689 | 8.15612 | ppm |
| Cd | 88.5162 | 52.1178 | ppm |
| Sn | 84.5727 | 29.8067 | ppm |
| Sb | -1.30779 | 18.7121 | ppm |
| Ba | 229.027 | 11.8242 | ppm |

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Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 17:07:31
ID: <C4327-5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 19563.8 | 636.231 | ppm |
| Ca | 5921.92 | 268.966 | ppm |
| Ti | 5348.32 | 232.099 | ppm |
| CrLO | 220.360 | 116.882 | ppm |
| Mn | 811.354 | 236.227 | ppm |
| Fe | 30316.7 | 571.889 | ppm |
| Cu | 77.9925 | 35.9126 | ppm |
| Zn | 176.612 | 32.9458 | ppm |
| Sr | 70.8214 | 6.46097 | ppm |
| Zr | 406.016 | 11.6030 | ppm |
| Pb | 1110.90 | 41.1553 | ppm |
| Rb | 68.4897 | 7.69337 | ppm |
| Cd | 111.970 | 49.7491 | ppm |
| Sn | 57.3743 | 28.0291 | ppm |
| Ba | 200.371 | 11.3411 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 17:22:11
ID: <6C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 10431.5 | 474.063 | ppm |
| Ca | 1383.00 | 156.034 | ppm |
| Ti | 4808.74 | 235.717 | ppm |
| Fe | 47319.5 | 701.201 | ppm |
| Ni | 113.704 | 62.0267 | ppm |
| Zn | 34.1327 | 26.7426 | ppm |
| As | 99.4555 | 38.2019 | ppm |
| Sr | 42.5919 | 5.46459 | ppm |
| Zr | 350.479 | 11.0263 | ppm |
| Pb | 385.995 | 26.4577 | ppm |
| Rb | 54.1621 | 7.24615 | ppm |
| Cd | 96.7752 | 40.9205 | ppm |
| Sn | 69.7339 | 23.8437 | ppm |
| Ba | 66.9154 | 7.24095 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 17:26:08
ID: <6D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 8841.07 | 439.598 | ppm |
| Ca | 1155.55 | 144.645 | ppm |
| Ti | 3189.38 | 212.172 | ppm |
| Fe | 54491.7 | 751.151 | ppm |
| Zn | 64.5399 | 29.9200 | ppm |
| As | 52.0431 | 40.4118 | ppm |
| Sr | 44.5150 | 5.70185 | ppm |
| Zr | 272.100 | 9.98234 | ppm |
| Mo | 3.88504 | 3.53067 | ppm |
| Pb | 452.774 | 28.8459 | ppm |
| Rb | 71.3367 | 8.15612 | ppm |
| Ba | 66.2711 | 7.35094 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 17:39:29
ID: <6B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 8903.95 | 440.885 | ppm |
| Ca | 970.611 | 139.235 | ppm |
| Ti | 3724.85 | 215.605 | ppm |
| Mn | 539.684 | 217.383 | ppm |
| Fe | 41512.9 | 652.128 | ppm |
| Zn | 137.026 | 32.3675 | ppm |
| As | 77.4060 | 37.1133 | ppm |
| Sr | 37.2649 | 5.14560 | ppm |
| Zr | 251.879 | 9.24563 | ppm |
| Pb | 376.385 | 25.6715 | ppm |
| Rb | 65.2670 | 7.58032 | ppm |
| Cd | 50.1390 | 39.3176 | ppm |
| Ba | 52.4057 | 6.55701 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 17:43:20
ID: <6B DUP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 8853.81 | 440.375 | ppm |
| Ca | 1430.01 | 152.724 | ppm |
| Ti | 4047.71 | 214.295 | ppm |
| CrLO | 200.420 | 119.102 | ppm |
| Fe | 44665.0 | 677.931 | ppm |
| Cu | 55.7460 | 35.7550 | ppm |
| Zn | 184.479 | 34.4698 | ppm |
| As | 109.202 | 41.5714 | ppm |
| Sr | 33.7904 | 5.04759 | ppm |
| Zr | 246.339 | 9.23234 | ppm |
| Pb | 488.482 | 28.9129 | ppm |
| Rb | 60.8517 | 7.50448 | ppm |
| Sn | 48.3787 | 23.0142 | ppm |
| Sb | 30.2969 | 14.8637 | ppm |
| Ba | 71.9603 | 7.33920 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 17:58:34
ID: <8B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 391.153 | 202.654 | ppm |
| K | 10132.1 | 478.183 | ppm |
| Ca | 6013.46 | 256.000 | ppm |
| Ti | 3290.19 | 202.810 | ppm |
| Fe | 28912.2 | 550.760 | ppm |
| Cu | 88.9707 | 36.5508 | ppm |
| Zn | 311.660 | 37.4817 | ppm |
| Sr | 69.6767 | 6.92884 | ppm |
| Zr | 236.060 | 9.34881 | ppm |
| Pb | 5600.47 | 92.6061 | ppm |
| Rb | 42.1624 | 7.52683 | ppm |
| Cd | 52.3170 | 39.1041 | ppm |
| Sn | 150.102 | 25.4073 | ppm |
| Sb | 154.755 | 18.7562 | ppm |
| Ba | 76.4607 | 7.61604 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 18:02:12
ID: <8C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 525.828 | 209.773 | ppm |
| K | 9584.39 | 468.176 | ppm |
| Ca | 6624.66 | 265.757 | ppm |
| Ti | 3614.55 | 213.819 | ppm |
| Fe | 28292.5 | 545.792 | ppm |
| Cu | 94.6896 | 36.7336 | ppm |
| Zn | 314.215 | 37.7067 | ppm |
| Sr | 50.2445 | 6.29816 | ppm |
| Zr | 255.515 | 9.68341 | ppm |
| Pb | 5809.65 | 94.6990 | ppm |
| Rb | 40.1777 | 7.51943 | ppm |
| Sn | 216.722 | 27.0205 | ppm |
| Sb | 123.438 | 17.8552 | ppm |
| Ba | 81.9769 | 7.84763 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 18:06:30
ID: <8D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 9866.97 | 473.619 | ppm |
| Ca | 6220.64 | 259.422 | ppm |
| Ti | 3552.42 | 207.569 | ppm |
| Fe | 31646.9 | 577.445 | ppm |
| Cu | 102.125 | 37.6680 | ppm |
| Zn | 248.855 | 35.8182 | ppm |
| Sr | 61.3700 | 6.78448 | ppm |
| Zr | 268.626 | 10.0439 | ppm |
| Pb | 6126.42 | 98.2860 | ppm |
| Rb | 33.1489 | 7.40077 | ppm |
| Sn | 214.294 | 27.2966 | ppm |
| Sb | 162.178 | 18.6536 | ppm |
| Ba | 84.2735 | 7.99735 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 18:09:59
ID: <8D DUP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 394.070 | 207.913 | ppm |
| K | 10852.0 | 492.686 | ppm |
| Ca | 5738.71 | 252.836 | ppm |
| Ti | 4232.12 | 225.133 | ppm |
| Fe | 28449.0 | 548.488 | ppm |
| Zn | 402.233 | 40.8754 | ppm |
| Sr | 63.2863 | 6.74103 | ppm |
| Zr | 358.747 | 11.3164 | ppm |
| Pb | 5503.29 | 91.9464 | ppm |
| Rb | 69.5295 | 8.49959 | ppm |
| Cd | 138.102 | 42.8496 | ppm |
| Sn | 224.297 | 27.9894 | ppm |
| Sb | 149.149 | 19.6516 | ppm |
| Ba | 93.2372 | 8.33344 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 18:13:55
ID: <9C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 7794.56 | 420.366 | ppm |
| Ca | 4295.88 | 217.059 | ppm |
| Ti | 3402.83 | 192.974 | ppm |
| Fe | 32047.4 | 569.389 | ppm |
| Zn | 199.314 | 32.1447 | ppm |
| Sr | 29.4831 | 4.51512 | ppm |
| Zr | 262.349 | 9.07397 | ppm |
| Pb | 368.843 | 24.2448 | ppm |
| Rb | 26.5173 | 5.56216 | ppm |
| Cd | 131.067 | 39.4018 | ppm |
| Sn | 24.8808 | 21.5949 | ppm |
| Ba | 55.2724 | 6.51024 | ppm |

NLI 002 1384

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 18:17:22
ID: <7B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 539.365 | 211.599 | ppm |
| K | 7930.14 | 421.105 | ppm |
| Ca | 2683.54 | 182.427 | ppm |
| Ti | 1866.83 | 183.705 | ppm |
| Fe | 67109.8 | 840.785 | ppm |
| Cu | 52.9921 | 37.2158 | ppm |
| Zn | 308.815 | 40.2540 | ppm |
| Sr | 40.1367 | 5.72811 | ppm |
| Zr | 302.784 | 10.9242 | ppm |
| Pb | 670.011 | 35.5210 | ppm |
| Rb | 43.5187 | 7.34355 | ppm |
| Sn | 28.4687 | 25.5177 | ppm |
| Sb | 53.7277 | 17.3771 | ppm |
| Ba | 82.3868 | 8.25581 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 20:33:55
ID: <D4328-9>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 322.681 | 208.092 | ppm |
| K | 19310.6 | 628.662 | ppm |
| Ca | 2476.91 | 203.061 | ppm |
| Ti | 5016.88 | 235.574 | ppm |
| CrLO | -92.3261 | 110.231 | ppm |
| Mn | 1958.73 | 280.284 | ppm |
| Fe | 26031.2 | 527.004 | ppm |
| Co | -238.735 | 171.868 | ppm |
| Ni | 55.9106 | 53.0660 | ppm |
| Cu | 33.2230 | 32.0678 | ppm |
| Zn | 27.4918 | 25.1025 | ppm |
| As | 25.0760 | 16.9399 | ppm |
| Se | -14.5635 | 11.1715 | ppm |
| Sr | 55.4325 | 5.62149 | ppm |
| Zr | 408.077 | 11.2742 | ppm |
| Mo | -2.80411 | 3.41707 | ppm |
| Hg | -5.82826 | 21.2206 | ppm |
| Pb | -6.10697 | 9.38752 | ppm |
| Rb | 65.1697 | 7.15746 | ppm |
| Cd | 42.8254 | 52.6149 | ppm |
| Sn | -24.3470 | 28.5557 | ppm |
| Sb | 19.3287 | 19.3363 | ppm |
| Ba | 249.053 | 12.2987 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 11-AUG-1992 20:41:26
ID: <C4327-6>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 17561.4 | 605.138 | ppm |
| Ca | 5807.26 | 263.327 | ppm |
| Ti | 4754.20 | 225.234 | ppm |
| CrLO | 122.829 | 113.018 | ppm |
| Mn | 1325.84 | 259.424 | ppm |
| Fe | 30301.0 | 569.783 | ppm |
| Zn | 184.643 | 33.1270 | ppm |
| Sr | 65.1010 | 6.24380 | ppm |
| Zr | 413.607 | 11.6787 | ppm |
| Pb | 1055.09 | 40.1548 | ppm |
| Rb | 76.0826 | 7.93859 | ppm |
| Sn | 29.1912 | 27.2364 | ppm |
| Ba | 181.747 | 10.8332 | ppm |

NLI 002 1387

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 08:47:58
ID: <ECAL>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 2204.44 | 554.877 | ppm |
| K | 1141.16 | 246.899 | ppm |
| Ca | 10633.1 | 294.683 | ppm |
| Ti | -158.860 | 77.8271 | ppm |
| CrLO | 413.590 | 131.233 | ppm |
| Mn | 1097.80 | 437.075 | ppm |
| Fe | -44.1005 | 225.243 | ppm |
| Co | 16.2339 | 172.786 | ppm |
| Ni | 104.643 | 114.300 | ppm |
| Cu | 110.702 | 73.5741 | ppm |
| Zn | 34.2877 | 53.8630 | ppm |
| As | -6278.78 | 724.775 | ppm |
| Se | -130.764 | 81.0476 | ppm |
| Sr | -9.80590 | 36.6172 | ppm |
| Zr | -7.19034 | 30.3178 | ppm |
| Mo | 5.09497 | 10.5070 | ppm |
| Hg | -257.126 | 96.3182 | ppm |
| Pb | 177777 | 1285.37 | ppm |
| Rb | -81.8898 | 31.0790 | ppm |
| Cd | 450.178 | 97.4756 | ppm |
| Sn | 173.385 | 60.2299 | ppm |
| Sb | 200.827 | 46.3466 | ppm |
| Ba | 126.008 | 19.3365 | ppm |

NLI 002 1388

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:00:20
ID: <RESCHK>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 178.553 | 83.5139 | ppm |
| K | 661.495 | 173.339 | ppm |
| Ca | 184.735 | 73.9773 | ppm |
| Ti | -3.20472 | 72.6992 | ppm |
| CrLO | -146.020 | 100.767 | ppm |
| Mn | -1343.94 | 1029.88 | ppm |
| Fe | 1.47515e+06 | 7137.36 | ppm |
| Co | -7143.54 | 1944.20 | ppm |
| Ni | 1455.27 | 940.433 | ppm |
| Cu | 97.9785 | 226.053 | ppm |
| Zn | 12.9964 | 137.998 | ppm |
| As | -58.6582 | 105.371 | ppm |
| Se | -87.8535 | 54.7400 | ppm |
| Sr | 10.8811 | 20.8120 | ppm |
| Zr | -7.01523 | 11.3572 | ppm |
| Mo | 0.287870 | 10.4049 | ppm |
| Hg | 120.573 | 162.678 | ppm |
| Pb | -95.0791 | 93.6219 | ppm |
| Rb | -42.7335 | 32.6038 | ppm |
| Cd | 1092.27 | 321.714 | ppm |
| Sn | 444.501 | 180.009 | ppm |
| Sb | 215.165 | 119.041 | ppm |
| Ba | 56.8428 | 31.7360 | ppm |

NTI 002 1389

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:06:29
ID: <D4328>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| CrHI | -36.4242 | 185.539 ppm |
| K | 19808.1 | 635.906 ppm |
| Ca | 2006.74 | 193.478 ppm |
| Ti | 5181.26 | 230.411 ppm |
| CrLO | 132.312 | 112.579 ppm |
| Mn | 1382.38 | 253.650 ppm |
| Fe | 24243.0 | 507.737 ppm |
| Co | 252.302 | 177.795 ppm |
| Ni | 50.2813 | 54.3318 ppm |
| Cu | 5.24429 | 30.1814 ppm |
| Zn | 62.9805 | 26.6555 ppm |
| As | -19.3389 | 16.9964 ppm |
| Se | -24.1800 | 10.5751 ppm |
| Sr | 44.1236 | 5.15207 ppm |
| Zr | 395.224 | 11.0075 ppm |
| Mo | 2.61461 | 3.51069 ppm |
| Hg | 29.5427 | 23.0198 ppm |
| Pb | 24.2473 | 11.1831 ppm |
| Rb | 80.5314 | 7.66122 ppm |
| Cd | 29.1294 | 50.3418 ppm |
| Sn | 58.0968 | 28.8477 ppm |
| Sb | 31.2296 | 18.8392 ppm |
| Ba | 228.573 | 11.7567 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:10:43
ID: <D4330>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 10655.5 | 510.556 | ppm |
| Ca | 35557.1 | 561.921 | ppm |
| Ti | 1245.10 | 139.883 | ppm |
| CrLO | 150.720 | 102.072 | ppm |
| Mn | 1914.02 | 374.946 | ppm |
| Fe | 159734 | 1431.12 | ppm |
| Ni | 341.890 | 127.697 | ppm |
| Cu | 92.0440 | 51.5124 | ppm |
| Zn | 290.789 | 47.4924 | ppm |
| As | 137.810 | 37.1206 | ppm |
| Sr | 53.4533 | 8.09817 | ppm |
| Zr | 75.8230 | 7.57261 | ppm |
| Pb | 104.155 | 23.7556 | ppm |
| Rb | 44.6107 | 9.67043 | ppm |
| Cd | 103.813 | 81.8038 | ppm |
| Ba | 73.4431 | 11.0802 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:15:51
ID: <C4327>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 17057.5 | 596.805 | ppm |
| Ca | 5678.62 | 259.998 | ppm |
| Ti | 3976.89 | 209.394 | ppm |
| Mn | 1288.34 | 249.567 | ppm |
| Fe | 28515.1 | 549.758 | ppm |
| Zn | 193.651 | 32.9683 | ppm |
| Sr | 73.9492 | 6.50235 | ppm |
| Zr | 356.748 | 10.7921 | ppm |
| Pb | 1084.37 | 40.2814 | ppm |
| Rb | 69.3866 | 7.61219 | ppm |
| Sb | 24.3548 | 16.9645 | ppm |
| Ba | 152.712 | 9.97572 | ppm |

Application: SOIL SAMPLES  Q003  01-12-1992
Meas Time:  12-AUG-1992  09:19:38
ID: <4497>
(    ) (       )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 20059.0 | 662.807 | ppm |
| Ca | 14185.0 | 390.242 | ppm |
| Ti | 4308.94 | 225.819 | ppm |
| CrLO | 123.267 | 121.909 | ppm |
| Mn | 737.392 | 245.939 | ppm |
| Fe | 29687.8 | 581.580 | ppm |
| Co | 413.235 | 206.365 | ppm |
| Zn | 98.2684 | 32.3324 | ppm |
| Sr | 115.907 | 9.43494 | ppm |
| Zr | 301.074 | 11.5350 | ppm |
| Pb | 11277.5 | 142.279 | ppm |
| Rb | 85.4649 | 10.3743 | ppm |
| Sn | 59.1037 | 33.7341 | ppm |
| Sb | 62.0952 | 22.5634 | ppm |
| Ba | 241.759 | 13.6696 | ppm |

NLI 02 1392

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:23:16
ID: <D4328-2>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 157.407 | 200.433 | ppm |
| K | 18918.0 | 622.179 | ppm |
| Ca | 1910.64 | 189.204 | ppm |
| Ti | 5078.67 | 230.129 | ppm |
| CrLO | 69.3497 | 111.458 | ppm |
| Mn | 2148.58 | 286.117 | ppm |
| Fe | 25386.9 | 519.660 | ppm |
| Co | -89.7033 | 173.472 | ppm |
| Ni | 96.7820 | 56.0468 | ppm |
| Cu | 35.4560 | 32.2786 | ppm |
| Zn | 57.4053 | 26.4699 | ppm |
| As | 24.9230 | 16.3792 | ppm |
| Se | 4.94792 | 12.0880 | ppm |
| Sr | 48.7470 | 5.31224 | ppm |
| Zr | 400.964 | 11.1329 | ppm |
| Mo | 6.10987 | 3.64019 | ppm |
| Hg | -68.0901 | 17.1523 | ppm |
| Pb | -14.6394 | 8.96041 | ppm |
| Rb | 94.2717 | 8.15548 | ppm |
| Cd | -8.49139 | 50.7972 | ppm |
| Sn | -1.34886 | 28.2903 | ppm |
| Sb | 0.924820 | 18.2746 | ppm |
| Ba | 233.085 | 11.8877 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:26:56
ID: <D4328-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -208.200 | 171.663 | ppm |
| K | 20231.5 | 642.162 | ppm |
| Ca | 2008.33 | 194.525 | ppm |
| Ti | 4974.74 | 234.028 | ppm |
| CrLO | -198.462 | 106.068 | ppm |
| Mn | 1572.76 | 261.338 | ppm |
| Fe | 25455.1 | 520.252 | ppm |
| Co | -221.771 | 170.023 | ppm |
| Ni | 98.5796 | 55.4012 | ppm |
| Cu | 5.42391 | 30.4039 | ppm |
| Zn | 62.4211 | 26.7590 | ppm |
| As | 24.6035 | 16.0507 | ppm |
| Se | -20.8920 | 10.7891 | ppm |
| Sr | 49.7024 | 5.39054 | ppm |
| Zr | 403.058 | 11.1550 | ppm |
| Mo | 0.442982 | 3.48440 | ppm |
| Hg | 24.0917 | 22.8863 | ppm |
| Pb | -17.2179 | 8.44422 | ppm |
| Rb | 85.6038 | 7.85782 | ppm |
| Cd | 29.4302 | 51.4432 | ppm |
| Sn | 13.3246 | 28.6688 | ppm |
| Sb | 36.6645 | 19.3292 | ppm |
| Ba | 221.831 | 11.6856 | ppm |

NLI 002 1394

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:30:36
ID: <D4328-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -92.0220 | 185.360 | ppm |
| K | 19845.4 | 636.471 | ppm |
| Ca | 2081.31 | 195.291 | ppm |
| Ti | 4913.32 | 229.995 | ppm |
| CrLO | 90.6269 | 113.125 | ppm |
| Mn | 2179.94 | 286.550 | ppm |
| Fe | 24871.8 | 514.907 | ppm |
| Co | -72.0913 | 172.497 | ppm |
| Ni | 66.8732 | 54.3303 | ppm |
| Cu | -3.95390 | 29.7703 | ppm |
| Zn | 40.1365 | 25.6292 | ppm |
| As | 27.0389 | 18.3755 | ppm |
| Se | -10.2972 | 11.3610 | ppm |
| Sr | 53.2696 | 5.52494 | ppm |
| Zr | 410.207 | 11.2638 | ppm |
| Mo | 10.3484 | 3.77547 | ppm |
| Hg | 2.24610 | 21.5661 | ppm |
| Pb | 14.6171 | 10.7848 | ppm |
| Rb | 76.1677 | 7.53595 | ppm |
| Cd | 87.2262 | 52.0551 | ppm |
| Sn | 39.2756 | 29.0374 | ppm |
| Sb | 4.86727 | 18.8252 | ppm |
| Ba | 230.251 | 11.8526 | ppm |

NLI 002 1395

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:34:25
ID: <7B>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| CrHI | 454.759 | 217.894 ppm |
| K | 8633.56 | 438.186 ppm |
| Ca | 3263.33 | 197.637 ppm |
| Ti | 2908.23 | 203.198 ppm |
| Mn | 430.676 | 251.840 ppm |
| Fe | 76511.2 | 908.416 ppm |
| Co | 584.430 | 300.711 ppm |
| Cu | 102.132 | 43.3074 ppm |
| Zn | 382.974 | 45.8601 ppm |
| Sr | 44.7407 | 6.25915 ppm |
| Zr | 372.808 | 12.5110 ppm |
| Mo | 20.0123 | 4.69216 ppm |
| Pb | 958.804 | 43.4220 ppm |
| Rb | 43.7859 | 7.84222 ppm |
| Sn | 30.4787 | 29.1212 ppm |
| Sb | 114.350 | 21.3188 ppm |
| Ba | 97.5911 | 9.28848 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:38:03
ID: <7C>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 7330.90 | 409.081 ppm |
| Ca | 3687.68 | 203.987 ppm |
| Ti | 2297.18 | 194.812 ppm |
| Fe | 71735.5 | 871.961 ppm |
| Ni | 151.385 | 77.2871 ppm |
| Cu | 138.266 | 44.8874 ppm |
| Zn | 258.153 | 40.8208 ppm |
| Sr | 40.0415 | 5.92376 ppm |
| Zr | 354.835 | 11.9956 ppm |
| Mo | 4.66052 | 4.10059 ppm |
| Pb | 896.680 | 41.4122 ppm |
| Rb | 52.6293 | 8.05353 ppm |
| Sn | 48.6894 | 28.9853 ppm |
| Sb | 80.0308 | 19.9851 ppm |
| Ba | 80.4503 | 8.58181 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:41:22
ID: <7D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 9119.14 | 449.928 | ppm |
| Ca | 4135.41 | 216.999 | ppm |
| Ti | 2723.69 | 207.035 | ppm |
| Fe | 75453.9 | 900.995 | ppm |
| Cu | 104.213 | 42.4273 | ppm |
| Zn | 335.933 | 43.4596 | ppm |
| Sr | 43.5522 | 6.16892 | ppm |
| Zr | 360.356 | 12.2339 | ppm |
| Pb | 1033.06 | 44.6409 | ppm |
| Rb | 36.0950 | 7.41187 | ppm |
| Sn | 78.8118 | 29.7028 | ppm |
| Sb | 78.8432 | 20.0708 | ppm |
| Ba | 109.865 | 9.62992 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:44:55
ID: <9B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 6191.94 | 380.593 | ppm |
| Ca | 3659.21 | 200.425 | ppm |
| Ti | 1953.26 | 170.269 | ppm |
| CrLO | 237.397 | 108.634 | ppm |
| Fe | 31219.1 | 559.064 | ppm |
| Cu | 107.019 | 35.7309 | ppm |
| Zn | 126.971 | 29.7836 | ppm |
| Sr | 23.9341 | 4.23363 | ppm |
| Zr | 248.364 | 8.78775 | ppm |
| Mo | 3.21682 | 3.09349 | ppm |
| Pb | 324.937 | 23.0714 | ppm |
| Rb | 18.5326 | 5.15249 | ppm |
| Cd | 47.6020 | 38.6797 | ppm |
| Sn | 40.0906 | 22.2520 | ppm |
| Ba | 44.9036 | 6.12507 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:48:25
ID: <9C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 8635.58 | 439.343 | ppm |
| Ca | 4433.78 | 221.588 | ppm |
| Ti | 2942.09 | 201.079 | ppm |
| Fe | 31992.4 | 570.344 | ppm |
| Cu | 35.4841 | 31.9443 | ppm |
| Zn | 133.844 | 30.0375 | ppm |
| Sr | 25.2602 | 4.33172 | ppm |
| Zr | 310.707 | 9.84301 | ppm |
| Pb | 359.287 | 24.0316 | ppm |
| Rb | 12.7680 | 4.88890 | ppm |
| Cd | 109.475 | 40.7967 | ppm |
| Sn | 75.4821 | 23.6582 | ppm |
| Sb | 35.8840 | 15.7076 | ppm |
| Ba | 56.9019 | 6.69314 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:51:53
ID: <9D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 7571.95 | 413.406 | ppm |
| Ca | 3168.14 | 192.688 | ppm |
| Ti | 2920.35 | 186.525 | ppm |
| Mn | 584.655 | 210.162 | ppm |
| Fe | 32341.0 | 571.615 | ppm |
| Ni | 115.533 | 54.0931 | ppm |
| Cu | 33.7973 | 32.0154 | ppm |
| Zn | 183.219 | 32.0608 | ppm |
| Sr | 33.9225 | 4.76103 | ppm |
| Zr | 278.226 | 9.34530 | ppm |
| Hg | 27.8381 | 23.4005 | ppm |
| Pb | 306.197 | 22.5958 | ppm |
| Rb | 24.8896 | 5.50418 | ppm |
| Cd | 72.2664 | 39.3219 | ppm |
| Sn | 22.2789 | 22.0233 | ppm |
| Sb | 24.6526 | 14.8784 | ppm |
| Ba | 58.5006 | 6.67995 | ppm |

NLI 002 1398

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:55:20
ID: <9C DUP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 8909.27 | 445.432 | ppm |
| Ca | 4552.85 | 224.339 | ppm |
| Ti | 3376.84 | 199.659 | ppm |
| CrLO | 185.631 | 110.686 | ppm |
| Mn | 531.340 | 218.916 | ppm |
| Fe | 40840.6 | 649.344 | ppm |
| Zn | 196.714 | 33.7318 | ppm |
| Sr | 31.0634 | 4.81995 | ppm |
| Zr | 321.528 | 10.3846 | ppm |
| Mo | 4.46586 | 3.52351 | ppm |
| Pb | 415.884 | 26.5753 | ppm |
| Rb | 27.6354 | 5.93283 | ppm |
| Cd | 57.6778 | 41.1577 | ppm |
| Sn | 26.2430 | 23.2253 | ppm |
| Ba | 50.4390 | 6.59605 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 09:59:42
ID: <11B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 354.875 | 200.155 | ppm |
| K | 6827.61 | 405.376 | ppm |
| Ca | 6126.43 | 252.051 | ppm |
| Ti | 2420.22 | 177.851 | ppm |
| CrLO | 130.142 | 106.439 | ppm |
| Fe | 18507.7 | 437.019 | ppm |
| Zn | 168.910 | 31.0000 | ppm |
| Sr | 33.9662 | 5.40786 | ppm |
| Zr | 167.071 | 7.69432 | ppm |
| Pb | 5933.25 | 91.6220 | ppm |
| Rb | 9.89207 | 6.00262 | ppm |
| Cd | 49.4092 | 43.4579 | ppm |
| Sn | 154.237 | 27.3043 | ppm |
| Sb | 160.580 | 19.8662 | ppm |
| Ba | 45.1189 | 6.61699 | ppm |

NLI 002 1399

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:07:15
ID: <11C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 198.540 | 190.090 | ppm |
| K | 8078.88 | 431.653 | ppm |
| Ca | 5257.41 | 237.820 | ppm |
| Ti | 2707.23 | 186.295 | ppm |
| Fe | 17024.8 | 418.536 | ppm |
| Cu | 60.0355 | 32.9209 | ppm |
| Zn | 146.809 | 30.1000 | ppm |
| Sr | 41.5780 | 5.40194 | ppm |
| Zr | 211.420 | 8.28248 | ppm |
| Pb | 4146.69 | 74.9696 | ppm |
| Rb | 22.9922 | 6.08439 | ppm |
| Sn | 188.765 | 28.3184 | ppm |
| Sb | 164.807 | 19.9739 | ppm |
| Ba | 71.3304 | 7.55208 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:10:50
ID: <11D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 8809.52 | 454.406 | ppm |
| Ca | 7758.18 | 283.501 | ppm |
| Ti | 2122.39 | 179.744 | ppm |
| Fe | 23914.4 | 500.635 | ppm |
| Cu | 215.138 | 42.4534 | ppm |
| Zn | 380.349 | 39.6913 | ppm |
| As | 196.249 | 135.039 | ppm |
| Sr | 32.7263 | 5.84557 | ppm |
| Zr | 141.125 | 7.56786 | ppm |
| Mo | 4.86835 | 3.09711 | ppm |
| Pb | 7674.33 | 108.980 | ppm |
| Rb | 12.6084 | 6.76437 | ppm |
| Cd | 99.4883 | 41.5595 | ppm |
| Sn | 243.155 | 28.2013 | ppm |
| Sb | 174.164 | 20.0071 | ppm |
| Ba | 70.3993 | 7.54977 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:15:31
ID: <D4328-5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -152.815 | 177.285 | ppm |
| K | 19838.7 | 636.478 | ppm |
| Ca | 2208.92 | 198.206 | ppm |
| Ti | 5094.81 | 232.403 | ppm |
| CrLO | -0.844126 | 110.509 | ppm |
| Mn | 1886.97 | 274.720 | ppm |
| Fe | 25704.4 | 523.393 | ppm |
| Co | -27.3687 | 176.024 | ppm |
| Ni | 110.039 | 57.2081 | ppm |
| Cu | -42.2768 | 27.5032 | ppm |
| Zn | 23.2233 | 24.8102 | ppm |
| As | 8.21394 | 18.5671 | ppm |
| Se | -10.3358 | 11.4136 | ppm |
| Sr | 59.6317 | 5.77719 | ppm |
| Zr | 397.446 | 11.1252 | ppm |
| Mo | 4.71843 | 3.60051 | ppm |
| Hg | -13.5156 | 20.7753 | ppm |
| Pb | 27.9385 | 11.6244 | ppm |
| Rb | 73.0386 | 7.44774 | ppm |
| Cd | 101.650 | 53.0018 | ppm |
| Sn | 34.9562 | 29.3747 | ppm |
| Sb | -1.52654 | 19.0105 | ppm |
| Ba | 232.009 | 11.9468 | ppm |

NLI 002 1401

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:19:48
ID: <C4327-2>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 17740.7 | 607.636 ppm |
| Ca | 5798.16 | 263.220 ppm |
| Ti | 3891.15 | 207.848 ppm |
| CrLO | 110.020 | 109.385 ppm |
| Mn | 1073.74 | 242.023 ppm |
| Fe | 28673.1 | 552.285 ppm |
| Cu | 42.5947 | 33.1683 ppm |
| Zn | 199.739 | 33.2404 ppm |
| Sr | 60.5514 | 6.00252 ppm |
| Zr | 353.399 | 10.7236 ppm |
| Pb | 989.878 | 38.5450 ppm |
| Rb | 65.1207 | 7.44486 ppm |
| Sb | 21.5242 | 17.3965 ppm |
| Ba | 189.537 | 10.8969 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:23:18
ID: <13B>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| CrHI | 1124.04 | 273.688 ppm |
| K | 13465.1 | 563.997 ppm |
| Ca | 9714.85 | 329.373 ppm |
| Ti | 3725.28 | 238.093 ppm |
| Mn | 670.732 | 272.203 ppm |
| Fe | 51727.3 | 778.351 ppm |
| Cu | 347.393 | 56.4844 ppm |
| Zn | 662.813 | 54.4385 ppm |
| Sr | 71.8058 | 10.0773 ppm |
| Zr | 394.378 | 14.8838 ppm |
| Pb | 20670.0 | 222.094 ppm |
| Rb | 59.2480 | 12.0517 ppm |
| Cd | 94.0882 | 56.6715 ppm |
| Sn | 1071.46 | 53.0192 ppm |
| Sb | 810.681 | 40.0804 ppm |
| Ba | 177.422 | 13.2528 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:27:10
ID: <13C>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 13690.0 | 566.351 ppm |
| Ca | 9587.62 | 326.985 ppm |
| Ti | 3805.45 | 240.376 ppm |
| Fe | 50404.3 | 762.818 ppm |
| Cu | 359.891 | 56.0174 ppm |
| Zn | 523.987 | 49.7795 ppm |
| Sr | 92.7786 | 10.4551 ppm |
| Zr | 338.344 | 13.7005 ppm |
| Mo | 16.0798 | 5.02314 ppm |
| Pb | 19304.5 | 210.100 ppm |
| Rb | 48.4315 | 11.3526 ppm |
| Cd | 91.6229 | 56.0545 ppm |
| Sn | 894.372 | 49.5094 ppm |
| Sb | 870.781 | 40.5921 ppm |
| Ba | 182.721 | 13.2305 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:31:15
ID: <13D>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 12810.4 | 550.645 ppm |
| Ca | 9838.29 | 329.293 ppm |
| Ti | 3169.49 | 234.814 ppm |
| Fe | 50537.4 | 761.933 ppm |
| Cu | 452.049 | 59.1329 ppm |
| Zn | 559.449 | 50.4664 ppm |
| Sr | 75.1539 | 9.89593 ppm |
| Zr | 345.112 | 13.8057 ppm |
| Pb | 19492.2 | 211.454 ppm |
| Rb | 34.0251 | 10.9292 ppm |
| Sn | 922.830 | 50.4885 ppm |
| Sb | 939.169 | 41.8236 ppm |
| Ba | 210.814 | 14.1114 ppm |

NLI 002 1403

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:46:33
ID: <D4328-6>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| CrHI | 49.6456 | 198.642 ppm |
| K | 20442.8 | 645.472 ppm |
| Ca | 2183.22 | 198.972 ppm |
| Ti | 5086.06 | 233.564 ppm |
| CrLO | 15.6677 | 111.979 ppm |
| Mn | 2442.44 | 298.484 ppm |
| Fe | 24918.5 | 516.628 ppm |
| Co | -35.3215 | 174.120 ppm |
| Ni | 235.272 | 63.6951 ppm |
| Cu | -31.0169 | 28.5772 ppm |
| Zn | 83.0244 | 27.6986 ppm |
| As | 19.3723 | 19.1017 ppm |
| Se | -17.4403 | 11.0402 ppm |
| Sr | 48.9515 | 5.37090 ppm |
| Zr | 424.251 | 11.4815 ppm |
| Mo | 2.12736 | 3.60327 ppm |
| Hg | 1.06278 | 21.6364 ppm |
| Pb | 30.6679 | 11.7056 ppm |
| Rb | 57.8019 | 6.87587 ppm |
| Cd | 72.0103 | 52.4327 ppm |
| Sn | -32.7725 | 28.0887 ppm |
| Sb | -12.8614 | 18.5322 ppm |
| Ba | 221.785 | 11.7030 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 10:50:13
ID: <C4327-3>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 18777.2 | 623.891 | ppm |
| Ca | 5911.30 | 267.054 | ppm |
| Ti | 3882.84 | 214.529 | ppm |
| CrLO | 121.958 | 114.005 | ppm |
| Mn | 1241.01 | 250.417 | ppm |
| Fe | 29402.7 | 560.382 | ppm |
| Zn | 177.402 | 32.4901 | ppm |
| Sr | 57.7493 | 5.93593 | ppm |
| Zr | 381.622 | 11.1733 | ppm |
| Pb | 1017.54 | 39.2010 | ppm |
| Rb | 75.6650 | 7.86806 | ppm |
| Sb | 18.5140 | 17.1485 | ppm |
| Ba | 179.599 | 10.6890 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:00:43
ID: <10B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 279.380 | 195.053 | ppm |
| K | 13167.1 | 532.882 | ppm |
| Ca | 7529.08 | 283.666 | ppm |
| Ti | 4457.57 | 231.574 | ppm |
| Mn | 416.442 | 212.105 | ppm |
| Fe | 30593.8 | 567.672 | ppm |
| Ni | 84.9863 | 54.1507 | ppm |
| Zn | 185.277 | 31.8430 | ppm |
| Sr | 72.0970 | 6.41615 | ppm |
| Zr | 399.726 | 11.4027 | ppm |
| Pb | 938.708 | 37.6311 | ppm |
| Rb | 51.3441 | 6.88972 | ppm |
| Cd | 137.436 | 41.4220 | ppm |
| Sn | 71.4247 | 23.7887 | ppm |
| Sb | 73.8733 | 17.0197 | ppm |
| Ba | 121.636 | 8.87359 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:04:32
ID: <10C>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 14263.2 | 553.403 ppm |
| Ca | 8674.37 | 302.648 ppm |
| Ti | 4851.90 | 234.945 ppm |
| CrLO | 166.377 | 119.803 ppm |
| Fe | 31269.1 | 575.429 ppm |
| Ni | 79.6342 | 55.8130 ppm |
| Cu | 51.2741 | 33.0704 ppm |
| Zn | 117.021 | 28.8589 ppm |
| As | 117.274 | 54.1218 ppm |
| Sr | 57.1371 | 5.88863 ppm |
| Zr | 348.237 | 10.7012 ppm |
| Pb | 1028.66 | 39.5167 ppm |
| Rb | 56.3511 | 7.12807 ppm |
| Cd | 54.6144 | 39.4521 ppm |
| Sb | 86.8865 | 16.7851 ppm |
| Ba | 112.579 | 8.60035 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:08:08
ID: <10D>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 11839.6 | 509.777 ppm |
| Ca | 8563.92 | 297.002 ppm |
| Ti | 4679.37 | 220.991 ppm |
| CrLO | 119.744 | 110.817 ppm |
| Mn | 468.884 | 210.669 ppm |
| Fe | 32321.3 | 582.953 ppm |
| Ni | 104.692 | 56.8089 ppm |
| Zn | 280.195 | 35.6020 ppm |
| Sr | 69.6795 | 6.38831 ppm |
| Zr | 311.838 | 10.2032 ppm |
| Pb | 1208.46 | 42.7089 ppm |
| Rb | 38.6530 | 6.46320 ppm |
| Cd | 100.170 | 39.4232 ppm |
| Sn | 48.3063 | 22.5476 ppm |
| Sb | 56.9309 | 15.9332 ppm |
| Ba | 89.7746 | 7.85675 ppm |

NLI 002 1406

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:11:35
ID: <12B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 12919.0 | 529.074 | ppm |
| Ca | 7888.58 | 288.889 | ppm |
| Ti | 4403.42 | 231.417 | ppm |
| Fe | 36317.9 | 619.366 | ppm |
| Ni | 75.6056 | 56.7740 | ppm |
| Zn | 166.236 | 31.5150 | ppm |
| Sr | 64.3914 | 6.28817 | ppm |
| Zr | 396.993 | 11.5803 | ppm |
| Pb | 1127.82 | 41.8857 | ppm |
| Rb | 47.9523 | 6.93209 | ppm |
| Cd | 168.405 | 41.6038 | ppm |
| Sn | 103.822 | 24.3203 | ppm |
| Ba | 111.582 | 8.65568 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:15:07
ID: <12C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 11475.6 | 501.536 | ppm |
| Ca | 7001.73 | 272.639 | ppm |
| Ti | 4801.98 | 231.868 | ppm |
| Mn | 588.043 | 220.266 | ppm |
| Fe | 38146.3 | 633.516 | ppm |
| Zn | 199.594 | 31.8564 | ppm |
| Sr | 49.5340 | 5.69531 | ppm |
| Zr | 366.362 | 11.1535 | ppm |
| Pb | 1236.83 | 43.8706 | ppm |
| Rb | 32.7234 | 6.26098 | ppm |
| Sn | 44.2164 | 20.3236 | ppm |
| Sb | 33.7834 | 13.2682 | ppm |
| Ba | 83.8597 | 7.50118 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:18:36
ID: <12D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 254.113 | 195.039 | ppm |
| K | 12076.6 | 512.739 | ppm |
| Ca | 7206.69 | 276.791 | ppm |
| Ti | 4189.73 | 226.655 | ppm |
| Fe | 35096.7 | 607.442 | ppm |
| Zn | 155.811 | 31.1818 | ppm |
| Sr | 56.2207 | 5.93249 | ppm |
| Zr | 399.762 | 11.5445 | ppm |
| Pb | 1085.72 | 40.9120 | ppm |
| Rb | 50.2480 | 6.98769 | ppm |
| Cd | 50.5431 | 43.3650 | ppm |
| Sn | 37.1991 | 24.7963 | ppm |
| Sb | 74.0830 | 17.6545 | ppm |
| Ba | 130.876 | 9.34802 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:22:09
ID: <12D DUP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 13186.4 | 533.850 | ppm |
| Ca | 8169.64 | 293.249 | ppm |
| Ti | 4693.35 | 218.086 | ppm |
| Fe | 40050.1 | 652.027 | ppm |
| Zn | 305.465 | 37.3896 | ppm |
| Sr | 67.3900 | 6.47371 | ppm |
| Zr | 386.014 | 11.5814 | ppm |
| Pb | 1270.76 | 44.8268 | ppm |
| Rb | 56.4652 | 7.41709 | ppm |
| Sn | 30.2999 | 23.3776 | ppm |
| Sb | 58.3978 | 16.1293 | ppm |
| Ba | 101.509 | 8.45085 | ppm |

NLI 002 1408

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:38:46
ID: <D4328-7>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 201.320 | 201.306 | ppm |
| K | 19258.0 | 627.620 | ppm |
| Ca | 2074.36 | 193.892 | ppm |
| Ti | 5072.48 | 232.308 | ppm |
| CrLO | 35.0421 | 111.988 | ppm |
| Mn | 1894.90 | 277.259 | ppm |
| Fe | 25949.4 | 525.944 | ppm |
| Co | 141.427 | 180.831 | ppm |
| Ni | 83.3165 | 56.6983 | ppm |
| Cu | 61.4678 | 33.9889 | ppm |
| Zn | 157.500 | 31.1790 | ppm |
| As | 17.5318 | 17.4257 | ppm |
| Se | -27.4967 | 10.5479 | ppm |
| Sr | 47.6293 | 5.32044 | ppm |
| Zr | 411.593 | 11.3247 | ppm |
| Mo | 5.92279 | 3.68288 | ppm |
| Hg | -15.4687 | 20.7346 | ppm |
| Pb | 5.12022 | 10.0640 | ppm |
| Rb | 69.4279 | 7.33314 | ppm |
| Cd | 132.230 | 53.1320 | ppm |
| Sn | 23.3769 | 29.0550 | ppm |
| Sb | -1.53703 | 19.0539 | ppm |
| Ba | 246.397 | 12.2406 | ppm |

NLI 002 1409

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 11:42:31
ID: <C4327-4>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 17611.2 | 606.017 | ppm |
| Ca | 6033.99 | 267.107 | ppm |
| Ti | 4185.73 | 217.542 | ppm |
| CrLO | 145.937 | 112.981 | ppm |
| Mn | 1184.17 | 248.064 | ppm |
| Fe | 28634.7 | 552.627 | ppm |
| Ni | 81.9757 | 56.5669 | ppm |
| Zn | 255.840 | 35.5985 | ppm |
| Sr | 54.3855 | 5.82522 | ppm |
| Zr | 355.265 | 10.7704 | ppm |
| Hg | 43.8988 | 25.3715 | ppm |
| Pb | 1019.83 | 39.2729 | ppm |
| Rb | 67.7428 | 7.57743 | ppm |
| Sn | 33.2299 | 26.6634 | ppm |
| Ba | 165.137 | 10.3348 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 12:56:51
ID: <15B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 11666.4 | 504.597 | ppm |
| Ca | 6927.73 | 271.596 | ppm |
| Ti | 3099.90 | 223.126 | ppm |
| Fe | 64015.1 | 830.736 | ppm |
| Ni | 232.389 | 75.8531 | ppm |
| Cu | 51.5966 | 37.0074 | ppm |
| Zn | 365.157 | 41.6450 | ppm |
| Sr | 72.4307 | 7.10368 | ppm |
| Zr | 418.009 | 12.8544 | ppm |
| Mo | 14.4252 | 4.40331 | ppm |
| Pb | 937.743 | 41.5274 | ppm |
| Rb | 57.1765 | 7.96908 | ppm |
| Sn | 64.1320 | 26.6082 | ppm |
| Sb | 73.8758 | 18.2304 | ppm |
| Ba | 154.549 | 10.5655 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:00:26
ID: <15B DUP>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 593.606 | 224.295 | ppm |
| K | 11255.2 | 497.220 | ppm |
| Ca | 7361.12 | 277.816 | ppm |
| Ti | 3430.24 | 228.875 | ppm |
| Fe | 66432.0 | 850.053 | ppm |
| Ni | 71.9610 | 70.2916 | ppm |
| Cu | 146.661 | 43.0117 | ppm |
| Zn | 517.773 | 47.9228 | ppm |
| Sr | 62.5013 | 6.81646 | ppm |
| Zr | 365.044 | 12.1233 | ppm |
| Mo | 13.7175 | 4.28985 | ppm |
| Pb | 838.441 | 39.7222 | ppm |
| Rb | 39.5646 | 7.28748 | ppm |
| Cd | 82.9286 | 45.0397 | ppm |
| Sn | 85.9083 | 26.7278 | ppm |
| Sb | 48.8184 | 17.6805 | ppm |
| Ba | 112.681 | 9.33329 | ppm |

NLi 002 1411

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:04:40
ID: <15C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 210.117 | 204.699 | ppm |
| K | 12967.3 | 528.298 | ppm |
| Ca | 6097.47 | 260.580 | ppm |
| Ti | 3726.66 | 233.913 | ppm |
| Fe | 87540.1 | 991.201 | ppm |
| Ni | 171.588 | 80.1250 | ppm |
| Cu | 120.303 | 44.2968 | ppm |
| Zn | 424.111 | 46.8684 | ppm |
| Sr | 61.4902 | 7.22502 | ppm |
| Zr | 390.466 | 13.2440 | ppm |
| Mo | 14.1865 | 4.65289 | ppm |
| Pb | 1330.90 | 52.1286 | ppm |
| Rb | 41.3973 | 8.00167 | ppm |
| Cd | 159.283 | 47.7680 | ppm |
| Sn | 76.7569 | 27.4308 | ppm |
| Sb | 43.5509 | 18.5211 | ppm |
| Ba | 112.971 | 9.74154 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:08:11
ID: <15D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 12020.5 | 509.808 | ppm |
| Ca | 5378.24 | 246.303 | ppm |
| Ti | 3319.37 | 233.453 | ppm |
| Mn | 1093.49 | 267.266 | ppm |
| Fe | 60937.9 | 809.540 | ppm |
| Ni | 136.387 | 71.6008 | ppm |
| Cu | 98.4145 | 39.7743 | ppm |
| Zn | 280.532 | 38.7420 | ppm |
| Sr | 64.6956 | 6.77444 | ppm |
| Zr | 485.574 | 13.7290 | ppm |
| Mo | 7.13175 | 4.37555 | ppm |
| Pb | 895.315 | 40.3402 | ppm |
| Rb | 43.9169 | 7.35533 | ppm |
| Cd | 88.8151 | 46.8479 | ppm |
| Sn | 37.1146 | 26.4313 | ppm |
| Sb | 60.3286 | 18.5545 | ppm |
| Ba | 138.555 | 10.0993 | ppm |

NLi 002 1412

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:11:46
ID: <14B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 6160.56 | 380.839 | ppm |
| Ca | 3631.90 | 200.359 | ppm |
| Ti | 4322.86 | 210.614 | ppm |
| Fe | 8286.21 | 290.816 | ppm |
| Ni | 99.4045 | 47.7825 | ppm |
| Zn | 133.571 | 27.1043 | ppm |
| As | 25.3476 | 17.9772 | ppm |
| Sr | 20.9900 | 3.60747 | ppm |
| Zr | 263.144 | 8.22461 | ppm |
| Mo | 3.12881 | 2.81663 | ppm |
| Pb | 44.9312 | 10.8703 | ppm |
| Rb | 4.85372 | 3.74379 | ppm |
| Cd | 119.679 | 43.6341 | ppm |
| Ba | 58.1894 | 6.71035 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:15:25
ID: <16B>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 11291.8 | 489.730 | ppm |
| Ca | 1804.08 | 167.233 | ppm |
| Ti | 2303.13 | 153.013 | ppm |
| CrLO | 164.247 | 92.3785 | ppm |
| Mn | 251.069 | 165.342 | ppm |
| Fe | 6454.59 | 259.336 | ppm |
| Co | 118.524 | 104.556 | ppm |
| Zn | 32.0823 | 22.6711 | ppm |
| As | 48.6010 | 15.8504 | ppm |
| Sr | 37.0096 | 4.29462 | ppm |
| Zr | 163.671 | 6.57462 | ppm |
| Rb | 20.4824 | 4.53874 | ppm |
| Sb | 18.8641 | 15.7374 | ppm |
| Ba | 105.727 | 8.05585 | ppm |

NLI 002 1413

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:18:57
ID: <17B>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 11793.6 | 510.539 ppm |
| Ca | 10115.1 | 318.980 ppm |
| Ti | 3380.40 | 230.409 ppm |
| Fe | 57973.4 | 791.713 ppm |
| Co | 449.832 | 263.451 ppm |
| Ni | 209.416 | 75.9175 ppm |
| Cu | 145.541 | 41.9298 ppm |
| Zn | 465.473 | 44.8544 ppm |
| Sr | 78.9964 | 7.29985 ppm |
| Zr | 441.692 | 13.1028 ppm |
| Mo | 5.10597 | 4.16034 ppm |
| Pb | 1100.16 | 44.3587 ppm |
| Rb | 59.4513 | 8.00547 ppm |
| Sb | 59.0287 | 16.8116 ppm |
| Ba | 128.794 | 9.62261 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:22:21
ID: <14C>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 4073.44 | 319.029 ppm |
| Ca | 1929.63 | 153.188 ppm |
| Ti | 1898.37 | 150.172 ppm |
| Mn | 461.890 | 169.360 ppm |
| Fe | 6284.41 | 252.748 ppm |
| Ni | 126.199 | 47.5782 ppm |
| Zn | 85.0443 | 24.8006 ppm |
| Sr | 15.0391 | 3.22941 ppm |
| Zr | 96.0825 | 5.06571 ppm |
| Pb | 53.2491 | 11.0145 ppm |
| Rb | 5.19640 | 3.65578 ppm |
| Cd | 61.5507 | 41.9190 ppm |
| Sn | 43.5605 | 23.7309 ppm |
| Ba | 53.3839 | 6.42840 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:26:02
ID: <14D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 259.075 | 188.469 | ppm |
| K | 5786.95 | 371.102 | ppm |
| Ca | 4475.14 | 216.082 | ppm |
| Ti | 1660.79 | 151.170 | ppm |
| Fe | 12009.9 | 346.540 | ppm |
| Ni | 75.9983 | 48.3926 | ppm |
| Zn | 176.966 | 29.5738 | ppm |
| Sr | 19.2688 | 3.59682 | ppm |
| Zr | 187.674 | 7.11365 | ppm |
| Pb | 72.2309 | 12.6199 | ppm |
| Rb | 5.42992 | 3.88443 | ppm |
| Cd | 163.193 | 45.8718 | ppm |
| Sn | 49.9746 | 25.3150 | ppm |
| Ba | 73.6030 | 7.31733 | ppm |

NLI 002 1415

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:30:10
ID: <D4328-8>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -254.338 | 167.888 | ppm |
| K | 18347.1 | 613.827 | ppm |
| Ca | 2376.10 | 198.775 | ppm |
| Ti | 5182.66 | 236.000 | ppm |
| CrLO | -409.287 | 97.6281 | ppm |
| Mn | 1769.94 | 269.184 | ppm |
| Fe | 26329.4 | 528.605 | ppm |
| Co | 345.952 | 186.223 | ppm |
| Ni | -53.9173 | 49.2745 | ppm |
| Cu | 53.0368 | 33.1045 | ppm |
| Zn | 20.2135 | 24.8155 | ppm |
| As | -14.8109 | 18.4332 | ppm |
| Se | 0.0227754 | 11.9578 | ppm |
| Sr | 55.8840 | 5.64557 | ppm |
| Zr | 409.815 | 11.3026 | ppm |
| Mo | 3.19684 | 3.59867 | ppm |
| Hg | -14.0576 | 20.7681 | ppm |
| Pb | 38.4428 | 12.3430 | ppm |
| Rb | 67.6936 | 7.26731 | ppm |
| Cd | 151.616 | 53.6774 | ppm |
| Sn | 70.6119 | 29.9993 | ppm |
| Sb | -22.4518 | 18.7799 | ppm |
| Ba | 261.192 | 12.5476 | ppm |

NLI 002 1416

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:34:55
ID: <C4327-5>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 18034.7 | 612.345 | ppm |
| Ca | 5661.57 | 261.621 | ppm |
| Ti | 4232.33 | 218.559 | ppm |
| CrLO | 233.617 | 117.108 | ppm |
| Mn | 1231.67 | 252.231 | ppm |
| Fe | 30575.3 | 571.454 | ppm |
| Cu | 62.7931 | 34.6944 | ppm |
| Zn | 139.640 | 31.1256 | ppm |
| Sr | 84.5363 | 6.87614 | ppm |
| Zr | 369.463 | 11.0694 | ppm |
| Pb | 1023.16 | 39.4058 | ppm |
| Rb | 74.1736 | 7.84452 | ppm |
| Sn | 38.9054 | 27.1038 | ppm |
| Ba | 163.550 | 10.3609 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:38:25
ID: <16C>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | 185.698 | 184.413 | ppm |
| K | 13229.8 | 528.841 | ppm |
| Ca | 3476.87 | 211.221 | ppm |
| Ti | 3760.41 | 206.039 | ppm |
| Fe | 12601.8 | 360.638 | ppm |
| Cu | 31.7461 | 29.5387 | ppm |
| Zn | 73.9486 | 25.8923 | ppm |
| Sr | 34.0278 | 4.39058 | ppm |
| Zr | 345.988 | 9.69091 | ppm |
| Pb | 40.9266 | 11.4318 | ppm |
| Rb | 37.6380 | 5.58042 | ppm |
| Cd | 160.330 | 45.2050 | ppm |
| Sn | 40.7595 | 24.8345 | ppm |
| Ba | 98.0591 | 8.04243 | ppm |

NLI 002 1417

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:42:06
ID: <16D>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 11697.9 | 498.328 ppm |
| Ca | 2323.69 | 181.268 ppm |
| Ti | 1994.87 | 154.472 ppm |
| Fe | 10267.9 | 323.149 ppm |
| Ni | 127.213 | 48.6319 ppm |
| Zn | 58.7553 | 24.6148 ppm |
| As | 43.0659 | 18.5590 ppm |
| Sr | 23.3488 | 3.76973 ppm |
| Zr | 86.8245 | 5.01188 ppm |
| Pb | 35.8588 | 10.8029 ppm |
| Rb | 30.9370 | 5.12937 ppm |
| Ba | 77.9415 | 7.45175 ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:45:37
ID: <17C>
( ) ( )

| | Value | Std. dev. |
|---|---|---|
| K | 12651.3 | 526.697 ppm |
| Ca | 10591.5 | 326.683 ppm |
| Ti | 3487.45 | 228.695 ppm |
| Fe | 58084.8 | 794.844 ppm |
| Cu | 145.568 | 41.5814 ppm |
| Zn | 516.320 | 46.6217 ppm |
| Sr | 78.2831 | 7.29348 ppm |
| Zr | 403.989 | 12.5642 ppm |
| Mo | 14.2713 | 4.32644 ppm |
| Pb | 1099.28 | 44.4605 ppm |
| Rb | 53.8361 | 7.78716 ppm |
| Sn | 34.1585 | 25.3955 ppm |
| Sb | 110.073 | 18.6870 ppm |
| Ba | 176.952 | 11.0715 ppm |

NLI 002 1418

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 13:49:07
ID: <17D>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 12788.4 | 530.071 | ppm |
| Ca | 11158.4 | 334.675 | ppm |
| Ti | 3300.92 | 238.941 | ppm |
| Fe | 58713.5 | 800.076 | ppm |
| Ni | 168.929 | 70.8811 | ppm |
| Cu | 196.131 | 44.5103 | ppm |
| Zn | 583.483 | 48.8647 | ppm |
| Sr | 77.2172 | 7.27847 | ppm |
| Zr | 419.296 | 12.8141 | ppm |
| Mo | 18.7402 | 4.50284 | ppm |
| Pb | 1261.53 | 47.3900 | ppm |
| Rb | 27.4289 | 6.62564 | ppm |
| Cd | 50.8542 | 45.0478 | ppm |
| Sn | 74.0410 | 26.7497 | ppm |
| Sb | 93.6867 | 18.9827 | ppm |
| Ba | 151.872 | 10.4671 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 14:05:55
ID: <C4327-6>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| K | 18654.0 | 621.792 | ppm |
| Ca | 5512.55 | 260.214 | ppm |
| Ti | 4144.37 | 220.228 | ppm |
| Mn | 1340.95 | 256.840 | ppm |
| Fe | 30102.4 | 567.693 | ppm |
| Co | 216.669 | 194.787 | ppm |
| Zn | 188.903 | 33.2129 | ppm |
| Sr | 74.8702 | 6.59249 | ppm |
| Zr | 382.539 | 11.2687 | ppm |
| Mo | 5.49148 | 3.71181 | ppm |
| Pb | 1007.78 | 39.2723 | ppm |
| Rb | 78.1566 | 8.00620 | ppm |
| Ba | 177.845 | 10.7003 | ppm |

Application: SOIL SAMPLES Q003 01-12-1992
Meas Time: 12-AUG-1992 14:08:45
ID: <D4328-9>
( ) ( )

| | Value | Std. dev. | |
|---|---|---|---|
| CrHI | -258.905 | 170.032 | ppm |
| K | 18808.2 | 620.727 | ppm |
| Ca | 2089.81 | 193.304 | ppm |
| Ti | 4756.48 | 234.036 | ppm |
| CrLO | -134.117 | 109.918 | ppm |
| Mn | 2181.77 | 285.612 | ppm |
| Fe | 26682.1 | 531.997 | ppm |
| Co | -544.047 | 165.868 | ppm |
| Ni | 54.8172 | 51.5521 | ppm |
| Cu | -16.7030 | 28.8516 | ppm |
| Zn | 45.3616 | 25.7445 | ppm |
| As | 32.1348 | 18.3959 | ppm |
| Se | -14.3999 | 11.1381 | ppm |
| Sr | 45.7389 | 5.19875 | ppm |
| Zr | 411.336 | 11.2866 | ppm |
| Mo | 0.216897 | 3.50401 | ppm |
| Hg | -61.4656 | 17.4088 | ppm |
| Pb | 12.5046 | 10.6146 | ppm |
| Rb | 86.1161 | 7.89386 | ppm |
| Cd | 92.9245 | 52.8292 | ppm |
| Sn | 49.7390 | 29.5886 | ppm |
| Sb | 2.82149 | 19.0480 | ppm |
| Ba | 244.625 | 12.2044 | ppm |

NLI 002 1420

# APPENDIX B
## Brown's Battery Breakage Site
## Metal Analysis Results
## National Lead Site

ldm/pueyo/fr-4643

NLI 002 1421

Table 1.1

Results of the Metals Analysis

Project # 2203 BROWN BATTERY SITE

Concentration reported as mg/kg

| Client# | Location | Antimony | Arsenic | Cadmium | Chromium | Iron | Lead | Nickel | Zinc |
|---|---|---|---|---|---|---|---|---|---|
| 4326C | S-1, Surface | 4 | 7 | 5U | 14 | 22000 | 520 | 20 | 110 |
| 4326D | S-1, At 18" | 4 | 3 | 5U | 13 | 19000 | 8 | 20 | 64 |
| 4327C | S-2, Surface | 4 | 6 | 5U | 15 | 20000 | <100 | 18 | 140 |
| ~~4327D~~ | ~~S-2, At 18"~~ | 3 | 2 | 5U | 15 | 16000 | 10 | 17 | 52 |
| 4328C | S-3, Surface | 3 | 5 | 5U | 18 | 19000 | 250 | 19 | 100 |
| 4328D | S-3, At 18" | 3 | 3 | 5U | 15 | 17000 | 7 | 19 | 49 |
| 4329C | S-4, Surface | 5 | 5 | 5U | 20 | 25000 | 290 | 25 | 80 |
| 4329D | S-4, At 18" | 8 | 6 | 5U | 27 | 31000 | 320 | 30 | 110 |
| 4330C | S-4, Surface | 7 | 42 | 5U | 23 | 58000 | 86 | 85 | 280 |
| 4330D | S-5, At 18" | 4 | 24 | 5U | 34 | 58000 | 160 | 200 | 210 |
| 3789D | N/A | 6 | 5 | 5U | 31 | 28000 | 440 | 32 | 82 |
| 4499B | SS99-0" | 7 | 4 | 5U | 26 | 35000 | 38 | 29 | 130 |
| 3319B | SS97-0" | 4 | 7 | 5U | 18 | 18000 | 5100 | 21 | 93 |
| 4498B | SS102-0" | 2U | 4 | 5U | 11 | 13000 | 470 | 17 | 81 |
| 4497B | SS120-0" | 5 | 6 | 5U | 17 | 16000 | 12000 | 19 | 99 |
| 4495B | SS116-0" | 6 | 5 | 5U | 24 | 28000 | 49 | 27 | 100 |
| 4500B | SS115-0" | 4 | 5 | 5U | 25 | 28000 | 1600 | 30 | 93 |
| 5590C | SS110-0" | 2U | 4 | 5U | 15 | 13000 | 440 | 18 | 140 |
| 4496B | SS93-0" | 2 | 5 | 5U | 14 | 17000 | 5300 | 18 | 140 |
| 5489B | SS139 | 4 | 4 | 5U | 19 | 28000 | 1000 | 26 | 150 |
| 5490B | SS142 | 3 | 2 | 5U | 19 | 15000 | 1900 | 23 | 1000. |
| 5491B | SS146 | 4 | 8 | 5U | 15 | 14000 | 880 | 26 | 210 |
| 5493B | SS157 | 3 | 11 | 5U | 15 | 20000 | 1200 | 22 | 110 |
| 5494B | SS158 | 3 | 12 | 5U | 14 | 16000 | 700 | 17 | 80 |
| 5492B | SS160 | 3 | 12 | 5U | 13 | 14000 | 1100 | 18 | 63 |
| 5460B | #6, Area A10P | 2U | 8 | 5U | 21 | 21000 | 1800 | 25 | 81 |
| 5461B | #2, Area A50 | 5 | 5 | 5U | 28 | 29000 | 52 | 32 | 82 |
| 5462B | #15, Area D0 | 3 | 9 | 5U | 17 | 18000 | 1200 | 20 | 86 |
| 5463B | #17, Area E0 | 5 | 16 | 5U | 18 | 23000 | 3200 | 24 | 130 |
| 5464B | #22, Area C50 | 5 | 5 | 5U | 29 | 25000 | 160 | 30 | 87 |
| 5465B | #30, Area E50 | 7 | 1 | 5U | 36 | 23000 | 880 | 35 | 96 |
| 5466B | #34, Area C100 | 6 | 1 | 5U | 33 | 27000 | 820 | 33 | 90 |
| 5467B | #41, Area E100 | 5 | 6 | 5U | 29 | 24000 | 530 | 29 | 110 |
| 5468B | #44 | 4 | 1U | 5U | 21 | 17000 | 950 | 22 | 99 |
| 5469B | #51 | 5 | 5 | 5U | 28 | 28000 | 190 | 30 | 83 |
| 5470B | #57 | 5 | 5 | 5U | 32 | 29000 | 80 | 32 | 98 |
| 5471B | #62 | 4 | 5 | 5U | 25 | 13000 | 1100 | 21 | 100 |
| 4280B | #63 | 4 | 13 | 5U | 18 | 19000 | 2800 | 19 | 85 |
| 4331B | #68 | 2U | 5 | 5U | 35 | 30000 | 1300 | 34 | 110 |
| 4332B | #73 | 2 | 5 | 5U | 14 | 14000 | 5000 | 15 | 85 |
| 4281B | #74 | 2U | 1 | 5U | 10 | 4900 | 13 | 10 | 28 |
| DETECTION LIMIT | | 2 | 1 | 5 | 10 | 10 | 5 | 5 | 5 |

U -denotes detection limit

NLI 002 1422

# Appendix B

Appendix B

APPENDIX B

Sediment Toxicity Testing RFP and Report

National Lead Site

/bovitz/fr-4643

NLI 002 1424

FOURTEEN-DAY SOLID PHASE TOXICITY TEST PROCEDURE
(solid phase sediment and water beaker test)
USING CHIRONOMUS TENTANS
Revision 1, (08/05/92)

Test procedures will be a modification of those described in Nebeker et al. (1984) and Peltier and Weber (1985). Larval midges will be exposed to test sediments in a static aerated system for a period of 14 days. Midges will be randomly selected from the culture and be of uniform age and size. Second instar larvae will be used. The source of the test organisms will be specified in the final report.

The chronic endpoint will be growth and will be noted after 14 days. The acute endpoint, survival, will also be determined at this time. Variations in weight and length will be used to define the growth of C. tentans. Growth of organisms in contaminated sediments will be compared to the initial mean biomass (wet and dry weight) and total length of organisms of similar age and size at the start of the test, as well as the weight and length of control organisms.

Approximately five samples will be collected from August 11 to 13, 1992 and shipped to the testing laboratory by overnight carrier arriving on August 14. Testing must be initiated within 4 days of receipt of samples by the laboratory. Samples should be stored in the original sample container at 4 degrees centigrade (°C). Samples will not be dried or frozen before toxicity tests are run.

Solid phase testing will utilize four replicate chambers per sample for test sediment and controls. Diluent will be water which is similar to water quality parameters of the river where sediments were collected. Reconstituted dilution water is preferred. Specific parameters desired which differ from normal dilution water are pH at or about 6.5 units, alkalinity between 30 and 50 mg $CaCO_3$ /L, and total hardness between 45 and 65 mg $CaCO_3$ /L.

The test chamber will consist of 1-liter glass beakers. Each beaker will contain 200 ml of sediment and 800 ml of dilution water. Samples will be sieved as received from the field using a U.S. Standard number 18 sieve (1 mm mesh) or smaller. Sediments may not be dried but may be diluted with water to facilitate sieving. The diluent water should be added to the test chamber and allowed to settle for 24 hours prior to the introduction of the test organisms. Fifteen (15) juveniles will be placed in each of the four replicate beakers for each test.

Deionized water should be added as needed to maintain the volume of the test solution at 1 liter. A quarter of the water in the test chamber should be removed after 7 days and replaced with fresh dilution water. Water changes and additions should be conducted so that the organisms and sediments are not disturbed. Any water added should be brought to the same temperature as water in the test chambers and aerated before it is added.

Dissolved oxygen, pH, and temperature will be measured in each test replicate on a daily basis. Total hardness and alkalinity will be measured at the start and conclusion of the test from a composite of each sample replicate group. Dissolved oxygen, pH, and temperature will also be measured immediately before and after the addition of any dilution water. Test chambers will be aerated throughout the test using Pasteur pipets that extend 2 to 4 millimeters below the surface. Dissolved oxygen should be maintained above 60% saturation. Aeration should not cause turbulence or disturb the sediment surface. The test temperature will be maintained at 22 $\pm$ 2 °C. Lighting will be maintained at 50-100 foot candles with a 16 hour light and 8 hour dark photoperiod and a 30 minute phase-in/phase-out period.

Organisms should be fed twice weekly with a suitable food such as Cerophyll for the duration of the test. Preparation of food and feeding rates are described in detail in Nebeker et al. (1984). The feeding rate should be sufficient to support growth without resulting in fungal production. Detailed records of feeding rates and sediment characteristics should be maintained.

At the conclusion of the test period, counts and growth measurements will be made of surviving organisms by transferring aliquots of sediment into 2-liter glass culture dishes and separating organisms from debris. This may be facilitated by sieving the sediment through a #50 US Standard size sieve. Length measurements will be total length in mm. Following measurement, organisms will be blotted dry, transferred to tared aluminum weighing boats and weighed (wet weight). They will then be placed in a drying oven at 105 °C for 8 hours, transferred to a desiccator and allowed to cool for 4 hours, and weighed to determine dry weight. This process will be repeated until a constant weight is reached.

As described in Nebeker et al. (1986), a reference toxicant test of the organisms must be completed to determine the appropriateness of the test population. Cadmium chloride (CdCl), provided by the US EPA/EMSL or equivalent, will be utilized in a 96-hour aqueous phase test. In addition, sediment control tests will be performed. With the exception of substrate, these tests will duplicate toxicity test conditions. The control sediment will either be collected by the testing laboratory from a location of known environmental quality, or constituted from known component parts. Control mortality will not exceed 20 percent.

The final report will include an introduction, a detailed description of all materials and methods, a results section, and a discussion section. The results section should include all applicable data including test results, calculations and statistical analysis. Results will be reported as number and percent dead for the mortality endpoints; growth will be reported as length and weight (wet and dry) measurements. A complete photographic record (on 35 mm slides) will be made of the entire testing procedure; a minimum of 36 exposures are to be provided. All laboratory and raw data including daily log sheets and water quality parameters, the photographic record, the reference toxicant and sediment test results will be placed in an appendix. The final report and photographic record will be due two weeks following completion of the toxicity testing. This report will be reviewed and may be returned to the laboratory for modifications.

## REFERENCES

Nebeker, A.V., M.A. Cairns, J.H. Gakstatter, K.W. Malueg, G.S. Schuytema and D.F. Krawczyk. 1984. Biological methods for determining toxicity of contaminated freshwater sediments to invertebrates. Environ. Tox. Chem. 3:617-630.

Nebeker, A.V. S.T. Onjukka, M.A. Cairns and D. F. Krawczyk. 1986. Survival of Daphnia magna and Hyalella azteca in cadmium spiked water and sediment. Environ. Tox. Chem. 5:933-938.

Peltier, W.H. and C.I. Weber. 1985. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. EPA/600/4-85/013.

AQUA SURVEY, INC.

FINAL REPORT
THE TOXICITY OF SEDIMENT
FROM NATIONAL LEAD

SEPTEMBER 8, 1992

BR92-1975 JOB #92-180

NLI 002 1427

499 Point Breeze Road • Flemington, New Jersey 08822 • Telephone (908) 788-8700 FAX (908) 788-9165

FINAL REPORT
THE TOXICITY OF SEDIMENT
FROM NATIONAL LEAD

SEPTEMBER 8, 1992

BR92-1975 JOB #92-180

TO

ROY F. WESTON - REAC
2890 WOODBRIDGE AVE
GSA RARITAN DEPOT 209
EDISON, NJ 08837-3679

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| | |
|---|---|
| Report: | The toxicity of sediment samples from National Lead. |
| Sponsor: | Roy F. Weston, REAC<br>2890 Woodbridge Ave<br>GSA Raritan Depot 209<br>Raritan, NJ 08837 |
| Testing Facility: | Aqua Survey, Inc.<br>499 Point Breeze Road<br>Flemington, NJ 08822 |
| Study Number: | 92-180 |
| Report: | 1975 |
| Date Study Started: | August 17, 1992 |
| Date Study Finish: | September 4, 1992 |
| Date Reported: | September 8, 1992 |
| Personnel: | S. Grasso, C. Nally, J. Banko, B. Vogel, S. Douglas, T. Pallop, C. Lawrence |

W. Scott Douglas — Date
Study Director





NLI 002 1430

## Summary

Samples of sediment from National Lead were collected by Weston personnel and shipped to Aqua Survey, Inc. (ASI) on August 11, 1992. Samples were received August 13, 1992. Samples were tested for toxicity to the midge, *Chironomus tentans*.

Samples of sediment were assessed using midge larvae in 14 day exposures. Controls exhibited 87% survival, with 33% of survivors either pupae or emerged adults. Only one other sample had larvae which pupated or emerged (15875, replicate 4). Observed effects were analyzed for statistical significance using Analysis of Variance and Dunnett's Multiple range test. After 14 days of exposure all samples tested showed some degree of toxicity. Significant mortality of midge larvae was noted in samples 14662 (100% mortality), 14664 (100% mortality) and 15876 (85% mortality). All surviving midges showed a significant amount of growth compared to the initial stocking weight and length (a minimum of 6.75 times initial dry weight). The surviving midge larvae from samples showing no acute toxicity were tested for effects on growth. Retardation of growth as measured by overall length was noted in sample 14663. Retardation of growth as measured by both wet and dry weight was noted in samples 14663 and 15875.

I. Objective

The objective of this test was to determine the toxic effects of test sediments from NATIONAL LEAD when in the environment of benthic invertebrates. The measures of potency are significant reduction in survival, average length, and average wet and dry weight of exposed organisms as compared to a control after fourteen days.

II. Test Material

Source: National Lead

Name: F,G 14662
F,G 14663
F,G 14664
F,G 15875
F,G 15876

Date Received: August 13, 1992

III. Materials and Methods

A. Method

The method employed was a modification of the method outlined by American Society of Testing Materials, Standard Guide for Conducting Sediment Toxicity Tests with Freshwater Invertebrates, E1383-90 and Nebeker, A.V. *et al.*, 1984, Environ. Toxicol. Chem. 3:617-630.

B. Test Organisms

Species

The test species for this test was *Chironomus tentans*, which is a representative benthic invertebrate.

Size/Age/Physical Condition

Animals used in this test were second instar larvae, appoximately 10 days old and appeared to be in good condition.

Source/Acclimation

All of the animals used were obtained from ASI general culture. Egg masses were placed in dilution water within 12 hours post laying.

C. Test System

Source of Dilution Water

Dilution water was soft reconstituted water with a pH of 6.5, alkalinity of 20 mg/L $CaCO_3$, and hardness of 56 mg/L $CaCO_3$.

Temperature

The test temperature was 22±2°C.

Test Vessels

The test vessels were 1-liter borosilicate glass beakers covered with petri plates and gently aerated through glass tipped aeration lines.

Photoperiod

The test was conducted on a 16-hour light/8-hour dark photoperiod with two 30 minute phase in / phase out periods.

D. Test Design

Test Levels

Four replicates of undiluted test sediment were tested and compared to four replicates of control sediment.

Control

A control sediment was obtained from Spruce Run Reservoir in Annandale, New Jersey. The controls were run using 100% control sediment and the same number of organisms as the test concentrations.

Beginning the Test

The test was initiated by placing approximately 200 $cm^3$ of seived test sediment into each of four replicate test vessels and filling the vessels with dilution water. Samples were seived through a 720 micron mesh screen prior to distribution to test vessels. The system was allowed to settle under gentle aeration overnight. After settling, 15 animals were chosen at random and gently added to the test vessels.

A partial water exchange was conducted on day 7. Two hundred fifty mL of test solution was removed and replaced with fresh dilution water. The test was of 14 days duration. All test vessels were examined for survival and growth at 14 days.

### Water Quality Measurements

Dissolved oxygen, pH, temperature and conductivity were determined at the start and daily in every test vessel. Total alkalinity and total hardness were measured on a composite from all replicates of each treatment at the start and at the end of the test. Dissolved oxygen, pH, temperature and conductivity were measured before and after the partial exchange on day 7.

### Ending the Test

At the conclusion of the test, animals were removed by seiving the sediment through a 1.0 mm screen. Surviving midges were measured to the nearest millimeter, blotted dry on a paper towel, and placed in preweighed aluminum weigh boats for wet weight determination. Dry weights were determined by drying to a constant weight at 105°C.

### Feeding

Animals were fed two to three times weekly as required on a diet of crushed cereal leaves.

## E. Reference Toxicant

A standard reference toxicant test with Cadmium Chloride was performed. The toxicant was dissolved in dilution water to make a stock solution which was diluted to achieve the desired concentration. No substrate was provided.

# IV. Results

Average survival ranged from zero to 92% in all treatments (see Table 1). Control survival was 87%. By day 14, 33% of the surviving controls had pupated or emerged. The only other emergence was observed in 15875 replicate 4 in which one had emerged and one had pupated. Emerged or pupated larvae were counted as survivors, but not counted in growth determinations. Analysis of variance testing with Dunnett's procedure indicated significant reduction of survival in samples 14662 (0.0%), 14664 (0.0%), and 15876 (15%) as compared to the controls. No significant reduction in survival was noted in other samples.

Average initial length was 6.6 mm. Average initial weights were 0.0018 g wet and 0.0002g dry. Average control length at test end was 18.80 mm. Average control weights were 0.01569 g wet and 0.00311 g dry. Analysis of variance testing with Dunnett's procedure indicated significant difference in length in sample 14663 (15.32 mm) as compared to the control (see Table 2). Analysis of variance testing with Dunnet's procedure indicated significant difference in wet weight in samples 14663 (0.00990 g) and 15875 (0.01296 g) (see Table 3). Significant difference in dry weight as compared to the controls was observed in samples 14663 (0.00148) and 15875 (0.00166) (see Table 4).

The test solution temperature was maintained at 22 ± 2°C. The pH ranged from 3.7 to 7.2. Conductivity ranged from 160 to 330 umhos/cm. Dissolved oxygen was kept at or above 4.5 mg/L in all test vessels. Alkalinity ranged from <4 to 56 mg/L. Hardness ranged from 56 to 88 mg/L (see Table 5).

The 48 hour LC50 for the reference toxicant was determined to be 3.96 mg/L. ASI does not have an extensive enough data base on CdCl to interpret these data.

## V. Source of Documentation

All original data documentation is being maintained at:

Aqua Survey, Inc.
499 Point Breeze Road
Flemington, NJ 08822

NLI 002 1435

recycled paper



asi 499 Point Breeze Road • Flemington New Jersey 08822 • Telephone (908)788-8700 FAX (908)788-9165

Table 1. Survival of Midge Larvae after 14 Day Exposure. Tests were initiated with 15 larvae per replicate.

| Sample | Replicate A | B | C | D | Percent Average |
|---|---|---|---|---|---|
| Control | 12 (80%) | 12 (80%) | 15 (100%) | 13 (87%) | 86.7 |
| 14662 | 0 | 0 | 0 | 0 | 00.0* |
| 14663 | 13 (87%) | 14 (92%) | 13 (87%) | 15 (100%) | 91.7 |
| 14664 | 0 | 0 | 0 | 0 | 00.0* |
| 15875 | 13 (87%) | 12 (80%) | 14 (92%) | 13 (87%) | 86.7 |
| 15876 | 4 (27%) | 2 (13%) | 3 (20%) | 0 | 15.0* |

* Samples which showed significant effect $p \leq 0.05$. Calculation by Dunnett's Test

Table 2. Mean Length of Midge Larvae after 14 Day Exposure. Tests were initiated with 15 larvae per replicate.

| Sample | Replicate A | B | C | D | Average |
|---|---|---|---|---|---|
| Control | 19.86 | 18.33 | 17.60 | 19.42 | 18.80 |
| 14662 | Not Applicable, significant mortality | | | | |
| 14663 | 15.60 | 15.15 | 14.21 | 16.31 | 15.32* |
| 14664 | Not Applicable, significant mortality | | | | |
| 15875 | 16.54 | 16.83 | 18.21 | 18.45 | 17.51 |
| 15876 | Not Applicable, significant mortality | | | | |

* Samples which showed significant effect $p \leq 0.05$. Calculation by Dunnett's Test

Table 3. Mean Wet Weight of Midge Larvae after 14 Day Exposure. Tests were initiated with 15 larvae per replicate. Weights in grams.

| Sample | Replicate A | Replicate B | Replicate C | Replicate D | Average |
|---|---|---|---|---|---|
| Control | .01826 | .01683 | .01371 | .01394 | .01569 |
| 14662 | Not Applicable, significant mortality | | | | |
| 14663 | .00930 | .00836 | .01174 | .01019 | .00990* |
| 14664 | Not Applicable, significant mortality | | | | |
| 15875 | .01185 | .01233 | .01309 | .01455 | .01296* |
| 15876 | Not Applicable, significant mortality | | | | |

* Samples which showed significant effect p≤0.05. Calculation by Dunnett's Test

Table 4. Mean Dry Weight of Midge Larvae after 14 Day Exposure. Tests were initiated with 15 larvae per replicate. Weights in grams.

| Sample | Replicate A | Replicate B | Replicate C | Replicate D | Average |
|---|---|---|---|---|---|
| Control | .00373 | .00350 | .00260 | .00259 | .00311 |
| 14662 | Not Applicable, significant mortality | | | | |
| 14663 | .00135 | .00121 | .00165 | .00172 | .00148* |
| 14664 | Not Applicable, significant mortality | | | | |
| 15875 | .00155 | .00157 | .00168 | .00185 | .00166* |
| 15876 | Not Applicable, significant mortality | | | | |

* Samples which showed significant effect p≤0.05. Calculation by Dunnett's Test

Table 5. Physical Chemical Readings

| Sample | Dissolved Oxygen (mg/L) | pH | Temperature (°C) | Conductivity (umhos/cm) |
|---|---|---|---|---|
| CONTROL | 5.6-8.4 | 6.4-7.0 | 20.0-23.5 | 160-195 |
| 14662 | 7.0-8.7 | 3.7-4.1 | 20.0-23.5 | 230-260 |
| 14663 | 6.3-8.4 | 5.5-6.7 | 20.0-23.5 | 190-250 |
| 14664 | 4.5-8.7 | 4.4-6.3 | 20.0-23.5 | 210-330 |
| 15875 | 6.5-8.6 | 5.2-7.2 | 20.0-23.5 | 185-220 |
| 15876 | 6.5-8.8 | 4.3-6.4 | 20.0-23.5 | 210-260 |

| | Total Alkalinity (mg/L) | Total Hardness (mg/L) |
|---|---|---|
| CONTROL | 16-20 | 56 |
| 14662 | <4 | 60-68 |
| 14663 | 20-32 | 68 |
| 14664 | 4-12 | 72-76 |
| 15875 | 25-56 | 64-88 |
| 15876 | 4-8 | 60-76 |

Table 6.1

Results of 96-hour Standard Reference Toxicant Bioassays with Cadmium Chloride. Bioassays were initiated with 10 organisms per replicate.

| Conc. (ppm) | Rep. | Final Live Counts *C. tentans* |
|---|---|---|
| control | A | 8 |
| | B | 10 |
| 3.2 | A | 6 |
| | B | 4 |
| 6.4 | A | 5 |
| | B | 3 |
| 12.8 | A | 2 |
| | B | 2 |
| 25.6 | A | 0 |
| | B | 0 |
| 51.2 | A | 0 |
| | B | 0 |

Table 6.2

Chemical/Physical Data Ranges for *C. tentans* Standard Reference Toxicant Test.

| Concentration (ppm) | pH | Temp. (C) | Dissolved Oxygen (ppm) |
|---|---|---|---|
| 0.0 | 6.2-7.1 | 19.0-22.5 | 5.0-8.1 |
| 3.2 | 6.4-7.1 | 19.5-22.5 | 5.8-8.2 |
| 6.4 | 6.4-6.8 | 19.0-22.5 | 6.2-8.4 |
| 12.8 | 6.3-6.7 | 19.0-22.5 | 5.6-8.4 |
| 25.6 | 6.3-6.6 | 19.0-22.5 | 5.8-8.6 |
| 51.2 | 6.2-6.6 | 19.5-22.5 | 7.4-8.8 |

AQUA SURVEY, INC
SOLID PHASE LIVE COUNTS

CLIENT: WESTON - REAC TEST START: 8-17-92 ORGANISM: C. tentans

JOB NUMBER: 92-180

| SAMPLE ID | RP | INITIAL | FINAL * | NOTES AND OBSERVATIONS |
|---|---|---|---|---|
| CONTROL | 1 | 15 | 12 7,2,3 | Feeding - 8/19 (2.0g in 50mL) 1/2 ml/chamber |
| | 2 | 15 | 12 6,2,4 | Feeding 8/21 Controls A → D 1/4 ml/chamber |
| | 3 | 15 | 15 10,5,0 | FG 14662 A → D |
| | 4 | 15 | 13 12,0,1 | FG 14663 A → D |
| FG14662 | 1 | 15 | ∅ | FG 14664 A, C + D |
| | 2 | 15 | ∅ | FG 15875 A → D |
| | 3 | 15 | ∅ | FG 15876 A + B |
| | 4 | 15 | ∅ | Feeding 8/24 control A → D 1/2 ml/chamber |
| FG14663 | 1 | 15 | 13 | SG FG 14662 A - D |
| | 2 | 15 | 14 | FG14663 A-D |
| | 3 | 15 | 13 | FG14664 A-D |
| | 4 | 15 | 15 | FG 15875 A-D |
| FG14664 | 1 | 15 | ∅ | FG 15876 AD |
| | 2 | 15 | ∅ | Feeding 8/27 control A → D 1/4 ml/chamber |
| | 3 | 15 | ~~1~~ SD 8/31 ∅ | SG FG 14662 B + C |
| | 4 | 15 | ∅ | FG 14663 A → D |
| FG15875 | 1 | 15 | 13 | FG 14664 A, B, + C |
| | 2 | 15 | ~~11~~ 12 SG 8/31 | FG 15875 A → D |
| | 3 | 15 | 14 | FG 15876 A, B, + D |
| | 4 | 15 | 13 11,1,1 | Feeding 8/28 control (A-D) 1/2 ml/chamber |
| FG15876 | 1 | 15 | 4 | SG FG14662 (A-D) (1g in 50mL) |
| | 2 | 15 | 2 | FG 14663 (A-D) |
| | 3 | 15 | 3 | FG 14664 (A-D) |
| | 4 | 15 | ∅ | FG 15875 (A-D) |
| | 1 | | | FG 15876 (A-D) |
| | 2 | | | |
| | 3 | | | - Con 1 - 1 midge larva was found on surface 8/31 SG |
| | 4 | | | |
| | 1 | | | |
| | 2 | | | * counts larvae if single |
| | 3 | | | number, if multiple stages |
| | 4 | | | then three digits refer |
| DATE | | 8/17 | 8/31 | to larvae, pupae, adults |
| INITIAL | | SD/SG | SD/SG | |



NLI 002 1440

SOLID PHASE READINGS

CLIENT: Weston REAC TEST START: 8-17-92 PARAMETER: D.O.

ORGANISM: C. tentans JOB NUMBER: 92-180

| SAMPLE ID | RP | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 1 | 8.1 | 7.7 | 7.6 | 8.2 | 8.4 | 7.4 | 6.8 | 6.7 | 7.6 | 6.9 | 6.7 | 6.4 | 7.1 | 7.5 | 7.2 |
| | 2 | 8.1 | 7.3 | 7.7 | 7.5 | 8.4 | 6.4 | 6.6 | 5.6 | 6.4 | 6.8 | 6.8 | 6.7 | 7.2 | 7.6 | 7.1 |
| | 3 | 8.1 | 7.4 | 7.7 | 7.9 | 8.4 | 7.2 | 6.5 | 6.3 | 7.9 | 7.1 | 6.9 | 6.9 | 7.5 | 7.7 | 7.3 |
| | 4 | 8.1 | 7.6 | 7.8 | 8.4 | 8.4 | 7.7 | 6.8 | 7.4 | 7.8 | 7.1 | 7.1 | 6.9 | 7.4 | 7.7 | 7.4 |
| F614662 | 1 | 7.9 | 7.7 | 7.9 | 8.4 | 8.7 | 8.0 | 7.0 | 7.9 | 7.7 | 7.5 | 7.7 | 7.3 | 7.8 | 7.8 | 7.8 |
| | 2 | 7.9 | 7.3 | 7.8 | 8.1 | 8.7 | 7.7 | 7.0 | 7.8 | 7.4 | 7.3 | 7.7 | 7.4 | 7.8 | 7.8 | 7.8 |
| | 3 | 7.9 | 7.4 | 7.9 | 8.2 | 8.7 | 7.8 | 7.0 | 8.0 | 7.7 | 7.4 | 7.6 | 7.0 | 7.7 | 7.8 | 7.7 |
| | 4 | 8.0 | 7.6 | 7.9 | 8.3 | 8.7 | 8.0 | 7.0 | 8.0 | 7.8 | 7.5 | 7.7 | 7.2 | 7.7 | 7.8 | 7.7 |
| F614663 | 1 | 8.0 | 7.7 | 7.9 | 8.3 | 7.8 | 7.8 | 7.0 | 7.0 | 8.0 | 7.5 | 7.7 | 7.2 | 7.5 | 7.7 | 7.5 |
| | 2 | 8.0 | 7.5 | 7.8 | 8.4 | 7.7 | 7.3 | 7.0 | 7.2 | 8.0 | 7.4 | 7.7 | 7.0 | 7.6 | 7.7 | 7.5 |
| | 3 | 8.0 | 7.6 | 7.8 | 8.3 | 7.7 | 7.7 | 6.9 | 7.6 | 7.8 | 7.2 | 7.2 | 7.2 | 7.4 | 7.3 | 6.3 |
| | 4 | 8.0 | 7.7 | 7.7 | 8.2 | 7.8 | 7.0 | 6.8 | 7.8 | 7.8 | 7.2 | 7.2 | 6.8 | 6.7 | 7.5 | 6.8 |
| F614664 | 1 | 8.2 | 7.8 | 7.9 | 8.4 | 8.7 | 7.9 | 7.0 | 8.0 | 8.0 | 7.6 | 7.7 | 7.4 | 7.8 | 7.8 | 7.8 |
| | 2 | 7.8 | 7.7 | 7.9 | 8.4 | 8.7 | 7.9 | 7.0 | 7.8 | 7.4 | 7.4 | 7.6 | 4.5 | 7.7 | 7.7 | 7.7 |
| | 3 | 7.8 | 7.7 | 7.7 | 7.6 | 8.7 | 7.8 | 6.9 | 7.8 | 7.4 | 7.5 | 7.7 | 7.2 | 7.7 | 7.8 | 7.6 |
| | 4 | 8.0 | 7.5 | 7.7 | 8.1 | 8.7 | 7.8 | 7.0 | 7.8 | 8.0 | 7.6 | 7.7 | 7.3 | 7.8 | 7.8 | 7.7 |
| F615875 | 1 | 7.5 | 7.1 | 7.8 | 8.1 | 8.5 | 7.5 | 7.0 | 7.7 | 7.9 | 7.1 | 7.1 | 6.7 | 7.5 | 7.5 | 7.3 |
| | 2 | 7.7 | 7.5 | 7.7 | 8.1 | 8.4 | 7.6 | 6.8 | 7.6 | 7.8 | 7.1 | 7.0 | 6.5 | 7.4 | 7.5 | 7.4 |
| | 3 | 7.9 | 7.5 | 7.7 | 8.1 | 8.6 | 7.3 | 6.8 | 7.4 | 7.8 | 6.9 | 6.8 | 6.6 | 7.5 | 7.6 | 7.1 |
| | 4 | 7.8 | 7.6 | 7.6 | 8.0 | 8.5 | 6.8 | 6.6 | 6.9 | 7.7 | 6.9 | 7.2 | 6.9 | 7.6 | 7.6 | 7.3 |
| F615876 | 1 | 8.0 | 7.4 | 7.9 | 8.3 | 8.8 | 6.5 | 7.0 | 7.8 | 8.0 | 7.5 | 7.6 | 7.5 | 7.8 | 7.7 | 7.6 |
| | 2 | 7.9 | 7.5 | 7.6 | 8.0 | 8.6 | 6.7 | 7.0 | 7.8 | 7.4 | 7.4 | 7.5 | 7.3 | 7.7 | 7.7 | 7.5 |
| | 3 | 7.9 | 7.5 | 7.7 | 7.9 | 8.6 | 6.7 | 6.9 | 7.6 | 7.3 | 7.3 | 7.5 | 7.3 | 7.7 | 7.8 | 7.6 |
| | 4 | 7.9 | 7.5 | 7.7 | 7.8 | 8.5 | 6.7 | 6.9 | 7.8 | 7.3 | 7.3 | 7.4 | 7.2 | 7.7 | 7.8 | 7.5 |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
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| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| DATE | | 8/17 | 8/18 | 8/19 | 8/20 | 8/21 | 8/22 | 8/23 | 8/24 | 8/25 | 8/26 | 8/27 | 8/28 | 8/29 | 8/30 | 8/31 |
| INITIALS | | SD/SG | SG | SG JB | SG BU | TP/CN | SD | SD | SD/SG | SG | SG JB | SG JB | SG LL | SG | SG | SG |



NLI 002 1441

SOLID PHASE READINGS

CLIENT: WESTON - REAC TEST START: 8-17-92 PARAMETER: pH

ORGANISM: C. tentans JOB NUMBER: 92-180

| SAMPLE ID | RP | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 1 | 6.5 | 6.5 | 6.8 | 6.9 | 6.8 | 6.8 | 6.8 | 6.8 | 6.6 | 6.8 | 6.6 | 6.6 | 6.5 | 7.0 | 6.5 |
| | 2 | 6.5 | 6.5 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 | 6.6 | 6.8 | 6.7 | 6.7 | 6.7 | 7.0 | 6.5 |
| | 3 | 6.5 | 6.5 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 | 6.7 | 6.8 | 6.7 | 6.7 | 6.7 | 7.0 | 6.4 |
| | 4 | 6.5 | 6.6 | 6.8 | 6.7 | 6.8 | 6.8 | 6.8 | 6.8 | 6.7 | 6.7 | 6.6 | 6.6 | 6.7 | 6.9 | 6.4 |
| FG14662 | 1 | 3.8 | 3.8 | 3.9 | 3.8 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 4.0 | 4.0 | 3.9 | 3.8 | 3.9 | 3.7 |
| | 2 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 4.0 | 3.9 | 3.9 | 4.0 | 4.1 | 4.0 | 3.9 | 4.0 | 3.9 |
| | 3 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 4.0 | 4.0 | 4.0 | 4.0 | 4.1 | 4.0 | 4.0 | 4.0 | 4.0 |
| | 4 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 4.0 | 3.9 | 4.0 | 4.0 | 4.0 | 3.9 | 3.9 | 3.9 | 3.8 |
| FG14663 | 1 | 5.7 | 5.8 | 5.7 | 5.7 | 5.8 | 5.7 | 5.8 | 5.7 | 5.7 | 5.9 | 6.2 | 6.4 | 6.6 | 6.3 | 6.6 |
| | 2 | 5.9 | 5.9 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 | 6.3 | 6.1 | 5.8 | 5.9 | 6.3 | 6.7 | 6.5 | 6.7 |
| | 3 | 5.5 | 5.7 | 5.7 | 5.6 | 5.9 | 5.9 | 5.9 | 6.0 | 6.1 | 6.0 | 6.3 | 6.3 | 6.7 | 6.5 | 6.6 |
| | 4 | 5.8 | 5.9 | 6.0 | 6.0 | 6.1 | 6.0 | 6.0 | 6.4 | 6.2 | 6.0 | 6.0 | 6.0 | 6.7 | 6.6 | 6.6 |
| FG14664 | 1 | 4.7 | 4.4 | 4.7 | 4.7 | 4.7 | 4.9 | 5.0 | 4.9 | 5.2 | 5.1 | 5.5 | 5.5 | 6.2 | 6.0 | 6.1 |
| | 2 | 5.4 | 4.5 | 4.6 | 4.6 | 4.7 | 4.9 | 5.1 | 5.0 | 5.2 | 5.1 | 5.6 | 5.5 | 6.3 | 6.1 | 6.1 |
| | 3 | 4.7 | 4.8 | 5.0 | 5.0 | 5.5 | 5.5 | 5.6 | 5.8 | 5.7 | 5.5 | 5.7 | 5.8 | 6.3 | 6.3 | 6.2 |
| | 4 | 4.7 | 4.7 | 4.8 | 4.8 | 5.1 | 5.3 | 5.4 | 5.3 | 5.5 | 5.6 | 5.6 | 5.5 | 6.0 | 6.2 | 6.1 |
| FG15875 | 1 | 6.7 | 6.8 | 6.9 | 7.0 | 7.0 | 7.0 | 7.1 | 7.1 | 7.0 | 6.7 | 6.6 | 6.4 | 6.0 | 5.7 | 5.3 |
| | 2 | 6.9 | 7.0 | 7.1 | 7.1 | 7.2 | 7.1 | 7.2 | 7.2 | 6.9 | 6.8 | 6.7 | 6.4 | 5.9 | 5.5 | 5.2 |
| | 3 | 6.8 | 6.8 | 7.0 | 7.0 | 7.1 | 7.1 | 7.1 | 7.1 | 6.8 | 6.7 | 6.7 | 6.6 | 6.3 | 5.9 | 5.5 |
| | 4 | 6.8 | 6.8 | 6.9 | 7.0 | 7.1 | 7.0 | 7.1 | 7.0 | 6.8 | 6.7 | 6.8 | 6.7 | 6.7 | 6.6 | 6.4 |
| FG15876 | 1 | 4.5 | 4.5 | 4.5 | 4.4 | 4.5 | 4.8 | 4.8 | 5.0 | 5.3 | 5.4 | 5.7 | 5.7 | 6.0 | 5.9 | 5.6 |
| | 2 | 4.3 | 4.6 | 4.5 | 4.6 | 4.8 | 5.0 | 5.3 | 5.7 | 5.8 | 6.0 | 6.3 | 6.3 | 6.3 | 5.8 | 5.0 |
| | 3 | 4.6 | 4.5 | 4.6 | 4.5 | 4.7 | 4.9 | 5.1 | 5.3 | 5.7 | 6.0 | 6.2 | 6.3 | 6.4 | 6.0 | 5.7 |
| | 4 | 4.3 | 4.4 | 4.5 | 4.5 | 4.7 | 5.0 | 5.2 | 5.5 | 5.9 | 6.0 | 6.3 | 6.4 | 6.4 | 6.1 | 5.5 |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
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| | 1 | | | | | | | | | | | | | | | |
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| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| DATE | | 8/17 | 8/18 | 8/19 | 8/20 | 8/21 | 8/22 | 8/23 | 8/24 | 8/25 | 8/26 | 8/27 | 8/28 | 8/29 | 8/30 | 8/31 |
| INITIALS | | SD/SG | SG | SG JB | SG | MP/CN | SD | SD | SD/SG | SG | SG JB | SG JB | SG CL | SG | SG | SG |



NLI 002 1442

SOLID PHASE READINGS

CLIENT: Weston-REAC TEST START: 8-17-92 PARAMETER: Temperature

ORGANISM: C. tentans JOB NUMBER: 92-180

| SAMPLE ID | RP | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | Po[illegible] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 1 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 23.0 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 22.5 | 23.0 | 23.0 | 23.0 | 23 |
| | 2 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 23.0 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 22.5 | 23.0 | 23.0 | 23.0 | 23 |
| | 3 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 23.0 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 22.5 | 23.0 | 22.5 | 23.0 | 23 |
| | 4 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 23.0 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 22.5 | 23.0 | 22.5 | 23.0 | 23 |
| F614662 | 1 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 23.0 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 22.5 | 23.0 | 22.5 | 23.0 | 23 |
| | 2 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 23.0 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 22.5 | 23.0 | 22.5 | 23.0 | 23 |
| | 3 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 23.0 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 23.0 | 23.0 | 22.5 | 23.0 | 23 |
| | 4 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 23.0 | 29.0 | 22.5 | 23.0 | 23 |
| F614663 | 1 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 2 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 3 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 23.0 | 23.0 | 22.5 | 23.0 | 23 |
| | 4 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 23.0 | 23.0 | 22.5 | 23.0 | 23 |
| F614664 | 1 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 2 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 3 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 4 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 23.0 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| F615875 | 1 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 2 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 3 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 4 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 22.0 | 22.5 | 22.5 | 23.0 | 23 |
| F615876 | 1 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 2 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 3 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 4 | 23.0 | 23.5 | 22.0 | 22.5 | 20.0 | 22.5 | 22.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23.0 | 22.5 | 22.5 | 23.0 | 23 |
| | 1 | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
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| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| DATE | | 8/17 | 8/18 | 8/19 | 8/20 | 8/21 | 8/22 | 8/23 | 8/24 | 8/25 | 8/26 | 8/27 | 8/27 | 8/29 | 8/30 | 8/31 | 8/[illegible] |
| INITIALS | | SG | SG | SG | SG | TAP/CW | SD | SD | SD/SG | SG | SG | SG TB | SG CC | SG | SG | SG | SG |



NLI 002 1443

SOLID PHASE READINGS

CLIENT: Weston - REAC TEST START: 8-17-92 PARAMETER: Conductivity

ORGANISM: C. tentans JOB NUMBER: 92-180

| SAMPLE ID | RP | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 1 | 160 | 180 | 175 | 180 | 170 | 190 | 190 | 190 | 185 | 190 | 190 | 190 | 190 | 190 | 190 |
| | 2 | 160 | 170 | 170 | 170 | 170 | 185 | 185 | 195 | 180 | 190 | 190 | 190 | 180 | 180 | 180 |
| | 3 | 160 | 165 | 170 | 170 | 170 | 185 | 185 | 190 | 180 | 185 | 180 | 180 | 180 | 180 | 185 |
| | 4 | 160 | 165 | 170 | 170 | 170 | 180 | 185 | 190 | 185 | 185 | 190 | 190 | 180 | 180 | 190 |
| FG14662 | 1 | 260 | 260 | 260 | 250 | 240 | 250 | 260 | 255 | 230 | 230 | 240 | 235 | 230 | 230 | 230 |
| | 2 | 260 | 260 | 260 | 260 | 245 | 260 | 260 | 260 | 230 | 235 | 235 | 230 | 230 | 230 | 235 |
| | 3 | 260 | 260 | 255 | 260 | 245 | 255 | 260 | 260 | 240 | 240 | 240 | 240 | 240 | 235 | 235 |
| | 4 | 260 | 260 | 250 | 250 | 240 | 255 | 255 | 255 | 240 | 240 | 240 | 240 | 240 | 240 | 240 |
| FG14663 | 1 | 200 | 210 | 210 | 205 | 195 | 210 | 205 | 205 | 200 | 205 | 220 | 220 | 230 | 240 | 250 |
| | 2 | 200 | 210 | 200 | 200 | 190 | 200 | 200 | 195 | 195 | 200 | 200 | 210 | 220 | 230 | 240 |
| | 3 | 200 | 220 | 220 | 215 | 205 | 215 | 215 | 220 | 210 | 210 | 220 | 220 | 230 | 230 | 240 |
| | 4 | 200 | 210 | 205 | 205 | 190 | 200 | 200 | 200 | 200 | 200 | 210 | 210 | 220 | 225 | 240 |
| FG14664 | 1 | 230 | 260 | 250 | 250 | 250 | 265 | 240 | 270 | 240 | 230 | 250 | 250 | 250 | 250 | 255 |
| | 2 | 270 | 285 | 290 | 300 | 290 | 315 | 310 | 330 | 260 | 270 | 280 | 280 | 280 | 260 | 290 |
| | 3 | 210 | 220 | 220 | 230 | 210 | 240 | 240 | 240 | 230 | 235 | 245 | 235 | 230 | 240 | 245 |
| | 4 | 230 | 245 | 240 | 250 | 240 | 255 | 260 | 260 | 240 | 240 | 250 | 250 | 240 | 245 | 250 |
| FG15875 | 1 | 215 | 220 | 220 | 220 | 210 | 210 | 210 | 210 | 200 | 200 | 200 | 190 | 185 | 185 | 190 |
| | 2 | 220 | 220 | 220 | 225 | 215 | 220 | 220 | 220 | 200 | 200 | 210 | 200 | 195 | 195 | 200 |
| | 3 | 210 | 230 | 220 | 220 | 210 | 220 | 215 | 210 | 200 | 200 | 200 | 195 | 190 | 190 | 195 |
| | 4 | 210 | 220 | 210 | 210 | 200 | 210 | 200 | 200 | 190 | 190 | 190 | 190 | 185 | 185 | 190 |
| FG15876 | 1 | 220 | 220 | 240 | 250 | 240 | 250 | 250 | 250 | 230 | 220 | 230 | 220 | 215 | 210 | 210 |
| | 2 | 230 | 230 | 240 | 240 | 235 | 250 | 250 | 250 | 220 | 220 | 225 | 215 | 220 | 220 | 220 |
| | 3 | 235 | 245 | 245 | 250 | 235 | 250 | 260 | 260 | 230 | 230 | 235 | 230 | 210 | 210 | 210 |
| | 4 | 240 | 245 | 250 | 255 | 245 | 255 | 260 | 260 | 235 | 235 | 240 | 230 | 220 | 215 | 215 |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| DATE | | 8/17 | 8/18 | 8/19 | 8/20 | 8/21 | 8/22 | 8/23 | 8/24 | 8/25 | 8/26 | 8/27 | 8/28 | 8/29 | 8/30 | 8/31 |
| INITIALS | | SD/SG | SG | SG/TB | SG | TR/CN | SD | SD | SD/SG | SG | SG | SG/TB | SG CL | SG | SG | SG |



NLI 002 1444

SOLID PHASE READINGS

CLIENT: Weston-REAC TEST START: 8-17-92 PARAMETER: Alkalinity

ORGANISM: C. tentans JOB NUMBER: 92-180

| SAMPLE ID | RP | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 1 | 20 | | | | | | | | | | | | | | 16 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| FG14662 | 1 | ~~74~~ | | | | | | | | | | | | | | <4 |
| | 2 | <4 SJ | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| FG14663 | 1 | 32 | | | | | | | | | | | | | | 20 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| FG14664 | 1 | 4 | | | | | | | | | | | | | | 12 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| FG15875 | 1 | 56 | | | | | | | | | | | | | | 25 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| FG15876 | 1 | 4 | | | | | | | | | | | | | | 8 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| DATE | | 8/17 | | | | | | | | | | | | | | 8/31 |
| INITIALS | | SJ | | | | | | | | | | | | | | SJ |



NLI 002 1445

SOLID PHASE READINGS

CLIENT: Weston-REAC TEST START: 8-17-92 PARAMETER: Hardness

ORGANISM: C. tentans JOB NUMBER: 92-180

| SAMPLE ID | RP | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 1 | 56 | | | | | | | | | | | | | | 56 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| F614662 | 1 | 68 | | | | | | | | | | | | | | 60 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| F614663 | 1 | 68 | | | | | | | | | | | | | | 68 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| F614664 | 1 | 72 | | | | | | | | | | | | | | 76 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| F615875 | 1 | 88 | | | | | | | | | | | | | | 64 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| F615876 | 1 | 76 | | | | | | | | | | | | | | 60 |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| DATE | | 8/17 | | | | | | | | | | | | | | 8/31 |
| INITIALS | | SH | | | | | | | | | | | | | | SH |



NLI 002 1446

AQUA SURVEY, INC
SOLID PHASE OBSERVATIONS

CLIENT: Weston REAC TEST START DATE: 8-17-92

JOB NUMBER: 92-180 TEST SPECIES: C. tentans

| SAMPLE ID | RP | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 1 | N | N | N | N | N | 1+ | 1+ | 1+ | N | N | N | N | N | |
| | 2 | N | N | N | N | N | 2+ | 2+ | 2+ | 1+ | N | N | N | N | |
| | 3 | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| | 4 | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| | 5 | N/A | | | | | | | | | | | | | |
| F614662 | 1 | N | 1+ | N | N | 2D | N | N | N | N | N | N | N | N | |
| | 2 | N | N | 2+ | N | N | N | N | N | N | N | N | N | N | |
| | 3 | N | N | 1+ | N | 1+ | 1D | N | N | N | N | N | N | N | |
| | 4 | N | N | 1+ | N | N | N | N | N | N | N | N | N | N | |
| | 5 | N/A | | | | | | | | | | | | | |
| F614663 | 1 | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | |
| | 2 | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | |
| | 3 | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | |
| | 4 | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | |
| | 5 | N/A | | | | | | | | | | | | | |
| F614664 | 1 | 1+ | 1+ | N | N | N | N | N | N | N | N | N | N | N | |
| | 2 | N | N | N | 1+ | 1+ | N | N | N | 1+ | N | N | N | N | |
| | 3 | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| | 4 | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| | 5 | N/A | | | | | | | | | | | | | |
| F615875 | 1 | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | |
| | 2 | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | |
| | 3 | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | |
| | 4 | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | N * | |
| | 5 | N/A | | | | | | | | | | | | | |
| F615876 | 1 | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| | 2 | N | N | 1+ | N | N | N | N | N | N | N | N | N | N | |
| | 3 | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| | 4 | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| | 5 | N/A | | | | | | | | | | | | | |
| DATE/INITIAL | | 8/18 SJ | 8/19 SJ | 8/20 SJ | 8/21 | 8/22 SJ | 8/23 SJ | 8/24 SJ | 8/25 SJ | 8/26 SJ | 8/27 SJ | 8/28 SJ | 8/29 SJ | 8/30 SJ | |

KEY: S = SWIMMER
F = FLOATER
+ = ON SURFACE
D = DEAD
N: nothing observed
*: sample very Turbid



NLI 002 1447

SOLID PHASE BIOASSAY
GROWTH DATA SHEET

CLIENT: WESTON REAC

JOB #: 92-180

DATE: 8-17-92

SPECIES C. tentans

SAMPLE ID: INITIAL

| | REP 1 | REP 2 | REP 3 | REP 4 | REP 5 |
|---|---|---|---|---|---|
| ORGANISM | LENGTH (mm) | LENGTH (mm) | LENGTH (mm) | LENGTH (mm) | LENGTH (mm) |
| 1 | 6.0 | | | | |
| 2 | 7.0 | | | | |
| 3 | 9.0 | | | | |
| 4 | 8.0 | | | | |
| 5 | 7.0 | | | | |
| 6 | 9.0 | | | | |
| 7 | 5.0 | | | | |
| 8 | 8.0 | | | | |
| 9 | 4.0 | | | | |
| 10 | 9.0 | | | | |
| 11 | 5.0 | | | | |
| 12 | 5.0 | | | | |
| 13 | 6.0 | | | | |
| 14 | 6.0 | | | | |
| 15 | 5.0 | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| TOTAL | 99 | | | | |
| # MEASURED | 15 | | | | |
| AVERAGE | 6.6 | | | | |
| DATE/INIT | 8/17 SAL | | | | |

NOT APPLICABLE



NLI 002 1448

SOLID PHASE BIOASSAY
GROWTH DATA SHEET

CLIENT: Weston Resc
JOB #: 92-180
DATE: 8-31-92
SPECIES C. tentans
SAMPLE ID: Control

| ORGANISM | REP 1 LENGTH (mm) | REP 2 LENGTH (mm) | REP 3 LENGTH (mm) | REP 4 LENGTH (mm) | REP 5 LENGTH (mm) |
|---|---|---|---|---|---|
| 1 | 21 | 22 | 18 | 17 | |
| 2 | 21 | 18 | 18 | 20 | |
| 3 | 22 | 21 | 20 | 18 | |
| 4 | 22 | 13 | 21 | 23 | |
| 5 | 15 | 21 | 16 | 22 | |
| 6 | 15 | 15 | 19 | 21 | |
| 7 | 23 | | 16 | 20 | |
| 8 | | | 15 | 17 | |
| 9 | | | 17 | 21 | |
| 10 | | | 16 | 18 | |
| 11 | | | | 23 | |
| 12 | | | | 13 | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| TOTAL | 139 | 110 | 176 | 233 | |
| # MEASURED | 7 | 6 | 10 | 12 | |
| AVERAGE | 19.86 | 18.33 | 17.60 | 19.42 | |
| DATE/INIT | SD/SG 8/31 | SD/SG 8/31 | SD/SG 8/31 | SD/SG 8/31 | |

SOLID PHASE BIOASSAY
GROWTH DATA SHEET

CLIENT: Weston Regc

JOB #: 92-180

DATE: 8-31-92

SPECIES C. tentans

SAMPLE ID: FG 14663

| ORGANISM | REP 4 SG 8/31 LENGTH (mm) | REP 1 LENGTH (mm) | REP 2 LENGTH (mm) | REP 3 SG 8/31 LENGTH (mm) | REP 5 LENGTH (mm) |
|---|---|---|---|---|---|
| 1 | 18 | 17 | 14 | 17 | |
| 2 | 13 | 17 | 17 | 15 | |
| 3 | 8 | 16 | 17 | 18 | |
| 4 | 20 | 17 | 17 | 16 | |
| 5 | 15 | 15 | 12 | 15 | |
| 6 | 17 | 15 | 13 | 21 | |
| 7 | 20 | 13 | 15 | 18 | |
| 8 | 17 | 14 | 14 | 12 | |
| 9 | 15 | 17 | 17 | 17 | |
| 10 | 14 | 14 | 16 | 16 | |
| 11 | 17 | 13 | 8 | 14 | |
| 12 | 15 | 12 | 11 | 15 | |
| 13 | 15 | 17 | 15 | 18 | |
| 14 | 17 | | 13 | | |
| 15 | 13 | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| TOTAL | 234 | 197 | 199 | 212 | |
| # MEASURED | 15 | 13 | 14 | 13 | |
| AVERAGE | 15.60 | 15.15 | 14.21 | 16.31 | |
| DATE/INIT | SW/SG 8/31 | SW/SG 8/31 | SW/SG 8/31 | SW/SG 8/31 | |



NLI 002 1450

SOLID PHASE BIOASSAY
GROWTH DATA SHEET

CLIENT: Weston Resc

JOB #: 92-180

DATE: 8-31-92

SPECIES C. Tentans

SAMPLE ID: FG15875

| ORGANISM | REP 1 LENGTH (mm) | REP 2 LENGTH (mm) | REP 3 LENGTH (mm) | REP 4 LENGTH (mm) | REP 5 LENGTH (mm) |
|---|---|---|---|---|---|
| 1 | 17 | 23 | 20 | 19 | |
| 2 | 22 | 14 | 18 | 19 | |
| 3 | 21 | 15 | 20 | 20 | |
| 4 | 15 | 18 | 13 | 20 | |
| 5 | 18 | 19 | 22 | 22 | |
| 6 | 14 | 20 | 12 | 17 | |
| 7 | 18 | 16 | 17 | 20 | |
| 8 | 21 | 14 | 18 | 16 | |
| 9 | 15 | 18 | 21 | 16 | |
| 10 | 17 | 15 | 18 | 17 | |
| 11 | 12 | 16 | 18 | 17 | |
| 12 | 14 | 14 | 20 | | |
| 13 | 11 | | 18 | | |
| 14 | | | 20 | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| TOTAL | 215 | 202 | 255 | 203 | |
| # MEASURED | 13 | 12 | 14 | 11 | |
| AVERAGE | 16.54 | 16.83 | 18.21 | 18.45 | |
| DATE/INIT | SD/SG 8/31 | SD/SG 8/31 | SD/SG 8/31 | SD/SG 8/31 | |



NLI 002 1451

SOLID PHASE BIOASSAY
GROWTH DATA SHEET

CLIENT: Weston REAC

SPECIES: C. tentans

JOB #: 92-180

SAMPLE ID: INITIAL

DATE: 8-17-92

WET WEIGHT CALCULATIONS

| | REPLICATE 1 | REPLICATE 2 | REPLICATE 3 | REPLICATE 4 | REPLICATE 5 |
|---|---|---|---|---|---|
| PAN AND SURVIVING ORGANISMS | 1.578g | | | | |
| EMPTY PAN MASS | 1.551g | | | | |
| MASS OF ORGANISMS | .027g | | | | |
| NUMBER WEIGHED | 15 | | NOT APPLICABLE | | |
| MEAN WET MASS | .0018 | | | | |
| DATE/INITIALS | SD 8/17 | | | | |

DRY WEIGHT CALCULATIONS

| | REPLICATE 1 | REPLICATE 2 | REPLICATE 3 | REPLICATE 4 | REPLICATE 5 |
|---|---|---|---|---|---|
| OVEN TIME IN / OUT | 11:15/5:15 | | | | |
| DESSICATOR TIME IN / OUT | 5:15/8:15am | | | | |
| DRY MASS # 1 | 1.554 | | | | |
| OVEN TIME IN / OUT | 8:15/4:20 | | | | |
| DESSICATOR TIME IN / OUT | 4:20/8:10am | | | | |
| DRY MASS # 2 | 1.553 | | | | |
| OVEN TIME IN / OUT | 8:15am/5:10pm | | | | |
| DESSICATOR TIME IN / OUT | 5:10/8:00am | | | | |
| DRY MASS # 3 | 1.553 | | NOT APPLICABLE | | |
| OVEN TIME IN / OUT | | | | | |
| DESSICATOR TIME IN / OUT | | | | | |
| DRY MASS # 4 | | | | | |
| EMPTY PAN MASS | 1.551 | | | | |
| NUMBER WEIGHED | 15 | | | | |
| MEAN DRY MASS | .0002g | | | | |
| DATE / INITIALS | 8/20/92 SD SG | | | | |



NLI 002 1452

SOLID PHASE BIOASSAY
GROWTH DATA SHEET

CLIENT: Weston Reac
JOB #: 92-180
DATE: 8-31-92
SPECIES: C. tentans
SAMPLE ID: Control

WET WEIGHT CALCULATIONS

| | REPLICATE 1 | REPLICATE 2 | REPLICATE 3 | REPLICATE 4 | REPLICATE 5 |
|---|---|---|---|---|---|
| PAN AND SURVIVING ORGANISMS | 0.1891 | 0.1615 | 0.2027 | 0.2302 | VOID |
| EMPTY PAN MASS | 0.0613 | 0.0605 | 0.0656 | 0.0629 | |
| MASS OF ORGANISMS | 0.1278 | 0.1010 | 0.1371 | 0.1673 | |
| NUMBER WEIGHED | ~~12~~ * 7 | ~~12~~ * 6 | ~~13~~ * 10 | ~~13~~ * 12 | |
| MEAN WET MASS | .01826 ~~.01065~~ * | .01683 ~~.00842~~ * | .01371 ~~.0094~~ * | .01394 ~~.01287~~ * | |
| DATE/INITIALS | 8/31 SD | 8/31 SD | 8/31 SD | 8/31 SD | |

*SD 8/31 wrong counts

DRY WEIGHT CALCULATIONS

| | REPLICATE 1 | REPLICATE 2 | REPLICATE 3 | REPLICATE 4 | REPLICATE 5 |
|---|---|---|---|---|---|
| OVEN TIME IN / OUT | 17:00 - 8:00 | | | | VOID |
| DESSICATOR TIME IN / OUT | 8:00 - 14:10 | | | | |
| DRY MASS # 1 | 0.0875 | 0.0815 | 0.0915 | 0.0941 | |
| OVEN TIME IN / OUT | 16:45 - 8:40 | | | | |
| DESSICATOR TIME IN / OUT | 8:40 - ~~2:30~~ 14:30 | | | | |
| DRY MASS # 2 | 0.0874 | 0.0815 | 0.0916 | ~~0.9~~ 0.0939 | |
| OVEN TIME IN / OUT | 16:50 - 8:15 | | | | |
| DESSICATOR TIME IN / OUT | 8:15 - 14:15 | | | | |
| DRY MASS # 3 | 0.0874 | 0.0815 | 0.0916 | 0.0940 | |
| OVEN TIME IN / OUT | | | | | |
| DESSICATOR TIME IN / OUT | | | | | |
| DRY MASS # 4 | | | | | |
| EMPTY PAN MASS | 0.0613 | 0.0605 | 0.0656 | 0.0629 | |
| NUMBER WEIGHED | 7 | 6 | 10 | 12 | |
| MEAN DRY MASS | .00373 | 0.0035 | 0.0026 | 0.00259 | |
| DATE / INITIALS | 9/4 SD SG | 9/4 SD SG | 9/4 SD SG | 9/4 SD SG | |



NLI 002 1453

SOLID PHASE BIOASSAY
GROWTH DATA SHEET

LIENT: Weston Regc

SPECIES: C. tentans

JOB #: 92-180

SAMPLE ID: FG 14663

ATE: 8-31-92

WET WEIGHT CALCULATIONS

| | REPLICATE 1 | REPLICATE 2 | REPLICATE 3 | REPLICATE 4 | REPLICATE 5 |
|---|---|---|---|---|---|
| PAN AND SURVIVING ORGANISMS | 0.1828 | 0.1806 | 0.2159 | 0.2163 | VOID |
| EMPTY PAN MASS | ~~0.0635~~ (1) | 0.0635 | 0.0633 | ~~0.0620~~ (2) | |
| MASS OF ORGANISMS | .1208 | .1171 | .1526 | .1528 | |
| NUMBER WEIGHED | 13 | 14 | 13 | 15 | |
| MEAN WET MASS | .00930 | .00836 | .01174 | .01019 | |
| DATE/INITIALS | SD 8/31 | SD 8/31 | SD 8/31 | SD 8/31 | |

(1) 0.0620 SG 8/31 (2) 0.0635 SG 8/31

DRY WEIGHT CALCULATIONS

| | REPLICATE 1 | REPLICATE 2 | REPLICATE 3 | REPLICATE 4 | REPLICATE 5 |
|---|---|---|---|---|---|
| OVEN TIME IN / OUT | 17:00 - 8:00 | | | | VOID |
| DESSICATOR TIME IN / OUT | 8:00 - 14:10 | | | | |
| DRY MASS # 1 | 0.0796 | 0.0806 | 0.0849 | 0.0895 | |
| OVEN TIME IN / OUT | 16:45 - 8:40 | | | | |
| DESSICATOR TIME IN / OUT | 8:40 - 14:30 | | | | |
| DRY MASS # 2 | 0.0796 | 0.0803 | 0.0847 | 0.0893 | |
| OVEN TIME IN / OUT | 16:50 - 8:15 | | | | |
| DESSICATOR TIME IN / OUT | 8:15 - 14:15 | | | | |
| DRY MASS # 3 | 0.0796 | 0.0804 | 0.0847 | 0.0893 | |
| OVEN TIME IN / OUT | | | | | |
| DESSICATOR TIME IN / OUT | | | | | |
| DRY MASS # 4 | | | | | |
| EMPTY PAN MASS | 0.0620 | 0.0635 | 0.0633 | 0.0635 | |
| NUMBER WEIGHED | 13 | 14 | 13 | 15 | |
| MEAN DRY MASS | 0.00135 | 0.00121 | 0.00165 | 0.00172 | |
| DATE / INITIALS | SD SG 9/4 | SD SG 9/4 | SD SG 9/4 | SD SG 9/4 | |

SOLID PHASE BIOASSAY
GROWTH DATA SHEET

LIENT: Weston Regc    SPECIES: C. Tentans

JOB #: 92-180    SAMPLE ID: F G 15875

ATE: 8-31-92

WET WEIGHT CALCULATIONS

| | REPLICATE 1 | REPLICATE 2 | REPLICATE 3 | REPLICATE 4 | REPLICATE 5 |
|---|---|---|---|---|---|
| PAN AND SURVIVING ORGANISMS | 0.2151 | 0.2101 | 0.2440 | 0.2245 | |
| EMPTY PAN MASS | 0.0611 | 0.0621 | 0.0607 | 0.0644 | |
| MASS OF ORGANISMS | .1540 | .1480 | .1833 | .1601 | VOID |
| NUMBER WEIGHED | 13 | 12 | 14 | ~~13~~ 11 | |
| MEAN WET MASS | .011846 | .01233 | .01309 | .01455 | |
| DATE/INITIALS | SWD 8/31 | SWD 8/31 | SWD 8/31 | SWD 8/31 | |

*SWD 8/31

DRY WEIGHT CALCULATIONS

| | REPLICATE 1 | REPLICATE 2 | REPLICATE 3 | REPLICATE 4 | REPLICATE 5 |
|---|---|---|---|---|---|
| OVEN TIME IN / OUT | 17:00-8:00 | | | | |
| DESSICATOR TIME IN / OUT | 8:00-14:10 | | | | |
| DRY MASS # 1 | 0.0816 | 0.0812 | 0.0845 | 0.0850 | |
| OVEN TIME IN / OUT | 16:45-8:40 | | | | |
| DESSICATOR TIME IN / OUT | 8:40-14:30 | | | | |
| DRY MASS # 2 | 0.0814 | 0.0808 | 0.0842 | 0.0847 | |
| OVEN TIME IN / OUT | 16:50-8:15 | | | | |
| DESSICATOR TIME IN / OUT | 8:15-14:15 | | | | VOID |
| DRY MASS # 3 | 0.0813 | 0.0809 | 0.0842 | 0.0847 | |
| OVEN TIME IN / OUT | | | | | |
| DESSICATOR TIME IN / OUT | | | | | |
| DRY MASS # 4 | | | | | |
| EMPTY PAN MASS | 0.0611 | 0.0621 | 0.0607 | 0.0644 | |
| NUMBER WEIGHED | 13 | 12 | 14 | 11 | |
| MEAN DRY MASS | 0.00155 | 0.00157 | 0.00168 | 0.00185 | |
| DATE / INITIALS | SWD SG 9/4 | SWD SG 9/4 | SWD SG 9/4 | SWD SG 9/4 | |



NLI 002 1455

Survival of C. tentans Weston REAC - National Lead
File: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

Chi-square test for normality: actual and expected frequencies

| INTERVAL | <-1.5 | -1.5 to <-0.5 | -0.5 to 0.5 | >0.5 to 1.5 | >1.5 |
|---|---|---|---|---|---|
| EXPECTED | 1.072 | 3.872 | 6.112 | 3.872 | 1.072 |
| OBSERVED | 0 | 6 | 6 | 4 | 0 |

Calculated Chi-Square goodness of fit test statistic = 3.3198
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Survival of C. tentans Weston REAC - National Lead
File: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro Wilks test for normality

D = 0.230

W = 0.963

Critical W (P = 0.05) (n = 16) = 0.887
Critical W (P = 0.01) (n = 16) = 0.844

Data PASS normality test at P=0.01 level. Continue analysis.

Survival of C. tentans Weston REAC - National Lead
File: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 5.08
Closest, conservative, Table H statistic = 120.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 4, df (# reps-1) = 3
Actual values ==> R (# groups) = 4, df (# avg reps-1) = 3.00

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Survival of C. tentans Weston REAC - National Lead
File: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

Bartletts test for homogeneity of variance

```
Calculated B statistic =    1.86
Table Chi-square value =   11.34   (alpha = 0.01)
Table Chi-square value =    7.81   (alpha = 0.05)

Average df used in calculation  ==>   df (avg n - 1) =    3.00
Used for Chi-square table value ==>   df (#groups-1) =    3
--------------------------------------------------------------------------------
```

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

TITLE: Survival of C. tentans Weston REAC - National Lead
FILE: ctsur.wr
TRANSFORM: ARC SINE(SQUARE ROOT(Y)) NUMBER OF GROUPS: 4

| GRP | IDENTIFICATION | REP | VALUE | TRANS VALUE |
|---|---|---|---|---|
| 1 | control | 1 | 0.8000 | 1.1071 |
| 1 | control | 2 | 0.8000 | 1.1071 |
| 1 | control | 3 | 1.0000 | 1.4413 |
| 1 | control | 4 | 0.8700 | 1.2019 |
| 2 | 14663 | 1 | 0.8700 | 1.2019 |
| 2 | 14663 | 2 | 0.9300 | 1.3030 |
| 2 | 14663 | 3 | 0.8700 | 1.2019 |
| 2 | 14663 | 4 | 1.0000 | 1.4413 |
| 3 | 15875 | 1 | 0.8700 | 1.2019 |
| 3 | 15875 | 2 | 0.8000 | 1.1071 |
| 3 | 15875 | 3 | 0.9300 | 1.3030 |
| 3 | 15875 | 4 | 0.8700 | 1.2019 |
| 4 | 15876 | 1 | 0.2700 | 0.5464 |
| 4 | 15876 | 2 | 0.1300 | 0.3689 |
| 4 | 15876 | 3 | 0.2000 | 0.4636 |
| 4 | 15876 | 4 | 0.0000 | 0.1295 |

Survival of C. tentans Weston REAC - National Lead
File: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

| GRP | IDENTIFICATION | N | MIN | MAX | MEAN |
|---|---|---|---|---|---|
| 1 | control | 4 | 1.107 | 1.441 | 1.214 |
| 2 | 14663 | 4 | 1.202 | 1.441 | 1.287 |
| 3 | 15875 | 4 | 1.107 | 1.303 | 1.204 |
| 4 | 15876 | 4 | 0.129 | 0.546 | 0.377 |

Survival of C. tentans Weston REAC - National Lead
File: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

| GRP | IDENTIFICATION | VARIANCE | SD | SEM |
|---|---|---|---|---|
| 1 | control | 0.025 | 0.158 | 0.079 |
| 2 | 14663 | 0.013 | 0.113 | 0.057 |
| 3 | 15875 | 0.006 | 0.080 | 0.040 |
| 4 | 15876 | 0.033 | 0.180 | 0.090 |

Survival of C. tentans Weston REAC - National Lead
File: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA TABLE

| SOURCE | DF | SS | MS | F |
|---|---|---|---|---|
| etween | 3 | 2.224 | 0.741 | 39.000 |
| Within (Error) | 12 | 0.230 | 0.019 | |
| otal | 15 | 2.454 | | |

Critical F value = 3.49 (0.05,3,12)
Since F > Critical F REJECT Ho:All groups equal

urvival of C. tentans Weston REAC - National Lead
File: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

| ROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | T STAT | SIG |
|---|---|---|---|---|---|
| 1 | control | 1.214 | 0.868 | | |
| 2 | 14663 | 1.287 | 0.918 | -0.746 | |
| 3 | 15875 | 1.204 | 0.868 | 0.112 | |
| 4 | 15876 | 0.377 | 0.150 | 8.591 | * |

unnett table value = 2.29 (1 Tailed Value, P=0.05, df=12,3)

urvival of C. tentans Weston REAC - National Lead
ile: ctsur.wr Transform: ARC SINE(SQUARE ROOT(Y))

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | Minimum Sig Diff (IN ORIG. UNITS) | % of CONTROL | DIFFERENCE FROM CONTROL |
|---|---|---|---|---|---|
| 1 | control | 4 | | | |
| 2 | 14663 | 4 | 0.178 | 20.5 | -0.050 |
| 3 | 15875 | 4 | 0.178 | 20.5 | 0.000 |
| 4 | 15876 | 4 | 0.178 | 20.5 | 0.718 |



NLI 002 1459

Length of C. tentans Weston REAC - National Lead
File: ctleng.wr          Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

---

D = 8.265

W = 0.893

Critical W (P = 0.05) (n = 12) = 0.859
Critical W (P = 0.01) (n = 12) = 0.805

---

Data PASS normality test at P=0.01 level. Continue analysis.

Length of C. tentans Weston REAC - National Lead
File: ctleng.wr          Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

---

Calculated B statistic = 0.06
Table Chi-square value = 9.21 (alpha = 0.01)
Table Chi-square value = 5.99 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 3.00
Used for Chi-square table value ==> df (#groups-1) = 2

---

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

ITLE: Length of C. tentans Weston REAC - National Lead
rILE: ctleng.wr
TRANSFORM: NO TRANSFORMATION NUMBER OF GROUPS: 3

| GRP | IDENTIFICATION | REP | VALUE | TRANS VALUE |
|---|---|---|---|---|
| 1 | control | 1 | 19.8600 | 19.8600 |
| 1 | control | 2 | 18.3300 | 18.3300 |
| 1 | control | 3 | 17.6000 | 17.6000 |
| 1 | control | 4 | 19.4200 | 19.4200 |
| 2 | 14663 | 1 | 15.6000 | 15.6000 |
| 2 | 14663 | 2 | 15.1500 | 15.1500 |
| 2 | 14663 | 3 | 14.2100 | 14.2100 |
| 2 | 14663 | 4 | 16.3100 | 16.3100 |
| 3 | 15875 | 1 | 16.5400 | 16.5400 |
| 3 | 15875 | 2 | 16.8300 | 16.8300 |
| 3 | 15875 | 3 | 18.2100 | 18.2100 |
| 3 | 15875 | 4 | 18.4500 | 18.4500 |

Length of C. tentans Weston REAC - National Lead
File: ctleng.wr Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

| GRP | IDENTIFICATION | N | MIN | MAX | MEAN |
|---|---|---|---|---|---|
| 1 | control | 4 | 17.600 | 19.860 | 18.803 |
| 2 | 14663 | 4 | 14.210 | 16.310 | 15.318 |
| 3 | 15875 | 4 | 16.540 | 18.450 | 17.508 |

Length of C. tentans Weston REAC - National Lead
File: ctleng.wr Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

| GRP | IDENTIFICATION | VARIANCE | SD | SEM |
|---|---|---|---|---|
| 1 | control | 1.056 | 1.028 | 0.514 |
| 2 | 14663 | 0.773 | 0.879 | 0.440 |
| 3 | 15875 | 0.926 | 0.962 | 0.481 |

Length of C. tentans Weston REAC - National Lead
File: ctleng.wr Transform: NO TRANSFORMATION

ANOVA TABLE

| SOURCE | DF | SS | MS | F |
|---|---|---|---|---|
| Between | 2 | 24.824 | 12.412 | 13.521 |
| Within (Error) | 9 | 8.265 | 0.918 | |
| Total | 11 | 33.090 | | |

Critical F value = 4.26 (0.05,2,9)
Since F > Critical F REJECT Ho:All groups equal

Length of C. tentans Weston REAC - National Lead
File: ctleng.wr Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | T STAT | SIG |
|---|---|---|---|---|---|
| 1 | control | 18.803 | 18.803 | | |
| 2 | 14663 | 15.318 | 15.318 | 5.144 | * |
| 3 | 15875 | 17.508 | 17.508 | 1.911 | |

Dunnett table value = 2.18 (1 Tailed Value, P=0.05, df=9,2)

Length of C. tentans Weston REAC - National Lead
File: ctleng.wr Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | Minimum Sig Diff (IN ORIG. UNITS) | % of CONTROL | DIFFERENCE FROM CONTROL |
|---|---|---|---|---|---|
| 1 | control | 4 | | | |
| 2 | 14663 | 4 | 1.477 | 7.9 | 3.485 |
| 3 | 15875 | 4 | 1.477 | 7.9 | 1.295 |

"et Weight of C. tentans Weston REAC - Nat. Lead
ile: ctwwt.wr          Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D =    0.003

  =    0.944

Critical W (P = 0.05) (n = 12) = 0.859
Critical W (P = 0.01) (n = 12) = 0.805

Data PASS normality test at P=0.01 level. Continue analysis.

Wet Weight of C. tentans Weston REAC - Nat. Lead
ile: ctwwt.wr          Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

| | | |
|---|---|---|
| alculated B statistic = | 1.14 | |
| Table Chi-square value = | 9.21 | (alpha = 0.01) |
| Table Chi-square value = | 5.99 | (alpha = 0.05) |

| | | |
|---|---|---|
| verage df used in calculation ==> | df (avg n - 1) = | 3.00 |
| Used for Chi-square table value ==> | df (#groups-1) = | 2 |

Data PASS homogeneity test at 0.01 level. Continue analysis.

"OTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

ITLE: Wet Weight of C. tentans Weston REAC - Nat. Lead
FILE: ctwwt.wr
TRANSFORM: NO TRANSFORMATION NUMBER OF GROUPS: 3

| GRP | IDENTIFICATION | REP | VALUE | TRANS VALUE |
|---|---|---|---|---|
| 1 | control | 1 | 0.1826 | 0.1826 |
| 1 | control | 2 | 0.1683 | 0.1683 |
| 1 | control | 3 | 0.1371 | 0.1371 |
| 1 | control | 4 | 0.1394 | 0.1394 |
| 2 | 14663 | 1 | 0.0930 | 0.0930 |
| 2 | 14663 | 2 | 0.0836 | 0.0836 |
| 2 | 14663 | 3 | 0.1174 | 0.1174 |
| 2 | 14663 | 4 | 0.1019 | 0.1019 |
| 3 | 15875 | 1 | 0.1185 | 0.1185 |
| 3 | 15875 | 2 | 0.1233 | 0.1233 |
| 3 | 15875 | 3 | 0.1309 | 0.1309 |
| 3 | 15875 | 4 | 0.1455 | 0.1455 |

transform (X)10

Wet Weight of C. tentans Weston REAC - Nat. Lead
File: ctwwt.wr Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

| GRP | IDENTIFICATION | N | MIN | MAX | MEAN |
|---|---|---|---|---|---|
| 1 | control | 4 | 0.137 | 0.183 | 0.157 |
| 2 | 14663 | 4 | 0.084 | 0.117 | 0.099 |
| 3 | 15875 | 4 | 0.119 | 0.146 | 0.130 |

Wet Weight of C. tentans Weston REAC - Nat. Lead
File: ctwwt.wr Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

| GRP | IDENTIFICATION | VARIANCE | SD | SEM |
|---|---|---|---|---|
| 1 | control | 0.000 | 0.022 | 0.011 |
| 2 | 14663 | 0.000 | 0.014 | 0.007 |
| 3 | 15875 | 0.000 | 0.012 | 0.006 |

transform (X)10



NLI 002 1467

Wet Weight of C. tentans Weston REAC - Nat. Lead
File: ctwwt.wr Transform: NO TRANSFORMATION

ANOVA TABLE

| SOURCE | DF | SS | MS | F |
|---|---|---|---|---|
| Between | 2 | 0.0067 | 0.0034 | 11.333 |
| Within (Error) | 9 | 0.0025 | 0.0003 | |
| Total | 11 | 0.0092 | | |

Critical F value = 4.26 (0.05,2,9)
Since F > Critical F REJECT Ho:All groups equal

transform X(10)



NLI 002 1468

Wet Weight of C. tentans Weston REAC - Nat. Lead
File: ctwwt.wr          Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2          Ho:Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | T STAT | SIG |
|---|---|---|---|---|---|
| 1 | control | 0.157 | 0.157 | | |
| 2 | 14663 | 0.099 | 0.099 | 4.725 | * |
| 3 | 15875 | 0.130 | 0.130 | 2.229 | * |

Dunnett table value = 2.18     (1 Tailed Value, P=0.05, df=9,2)

Wet Weight of C. tentans Weston REAC - Nat. Lead
File: ctwwt.wr          Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2          Ho:Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | Minimum Sig Diff (IN ORIG. UNITS) | % of CONTROL | DIFFERENCE FROM CONTROL |
|---|---|---|---|---|---|
| 1 | control | 4 | | | |
| 2 | 14663 | 4 | 0.027 | 17.0 | 0.058 |
| 3 | 15875 | 4 | 0.027 | 17.0 | 0.027 |

transform X(10)

```
Dry weight of C. tentans Weston-REAC National Lead
File: dryct.wes        Transform: NO TRANSFORMATION

hapiro Wilks test for normality
---------------------------------------------------------------------------

  = 12998.500

W =    0.970

 ritical W (P = 0.05) (n = 12) = 0.859
critical W (P = 0.01) (n = 12) = 0.805
---------------------------------------------------------------------------

 ata PASS normality test at P=0.01 level. Continue analysis.


ry weight of C. tentans Weston-REAC National Lead
File: dryct.wes        Transform: NO TRANSFORMATION

 artletts test for homogeneity of variance
---------------------------------------------------------------------------

 alculated B statistic =     5.31
 able Chi-square value =     9.21  (alpha = 0.01)
Table Chi-square value =     5.99  (alpha = 0.05)

 verage df used in calculation  ==>   df (avg n - 1) =    3.00
 sed for Chi-square table value ==>   df (#groups-1) =    2
---------------------------------------------------------------------------

 ata PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is
      used to calculate the B statistic (see above).
```

'ITLE: Dry weight of C. tentans Weston-REAC National Lead
.'ILE: dryct.wes
TRANSFORM: NO TRANSFORMATION NUMBER OF GROUPS: 3

| GRP | IDENTIFICATION | REP | VALUE | TRANS VALUE |
|---|---|---|---|---|
| 1 | control | 1 | 373.0000 | 373.0000 |
| 1 | control | 2 | 350.0000 | 350.0000 |
| 1 | control | 3 | 260.0000 | 260.0000 |
| 1 | control | 4 | 259.0000 | 259.0000 |
| 2 | 14663 | 1 | 135.0000 | 135.0000 |
| 2 | 14663 | 2 | 121.0000 | 121.0000 |
| 2 | 14663 | 3 | 165.0000 | 165.0000 |
| 2 | 14663 | 4 | 172.0000 | 172.0000 |
| 3 | 15875 | 1 | 155.0000 | 155.0000 |
| 3 | 15875 | 2 | 157.0000 | 157.0000 |
| 3 | 15875 | 3 | 168.0000 | 168.0000 |
| 3 | 15875 | 4 | 185.0000 | 185.0000 |

transform $(x) \cdot 10^5$

Dry weight of C. tentans Weston-REAC National Lead
File: dryct.wes Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

| GRP | IDENTIFICATION | N | MIN | MAX | MEAN |
|---|---|---|---|---|---|
| 1 | control | 4 | 259.000 | 373.000 | 310.500 |
| 2 | 14663 | 4 | 121.000 | 172.000 | 148.250 |
| 3 | 15875 | 4 | 155.000 | 185.000 | 166.250 |

Dry weight of C. tentans Weston-REAC National Lead
File: dryct.wes Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

| GRP | IDENTIFICATION | VARIANCE | SD | SEM |
|---|---|---|---|---|
| 1 | control | 3556.333 | 59.635 | 29.818 |
| 2 | 14663 | 587.583 | 24.240 | 12.120 |
| 3 | 15875 | 188.917 | 13.745 | 6.872 |

transform $(x) \cdot 10^5$



NLI 002 1472

Dry weight of C. tentans Weston-REAC National Lead
File: dryct.wes        Transform: NO TRANSFORMATION

ANOVA TABLE

| SOURCE | DF | SS | MS | F |
|---|---|---|---|---|
| Between | 2 | 63276.167 | 31638.083 | 21.906 |
| Within (Error) | 9 | 12998.500 | 1444.278 | |
| Total | 11 | 76274.667 | | |

Critical F value = 4.26 (0.05,2,9)
Since F > Critical F REJECT Ho:All groups equal

Transform $(x) \cdot 10^5$



NLI 002 1473

Dry weight of C. tentans Weston-REAC National Lead
File: dryct.wes Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | T STAT | SIG |
|---|---|---|---|---|---|
| 1 | control | 310.500 | 310.500 | | |
| 2 | 14663 | 148.250 | 148.250 | 6.038 | * |
| 3 | 15875 | 166.250 | 166.250 | 5.368 | * |

Dunnett table value = 2.18 (1 Tailed Value, P=0.05, df=9,2)

Dry weight of C. tentans Weston-REAC National Lead
File: dryct.wes Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | Minimum Sig Diff (IN ORIG. UNITS) | % of CONTROL | DIFFERENCE FROM CONTROL |
|---|---|---|---|---|---|
| 1 | control | 4 | | | |
| 2 | 14663 | 4 | 58.582 | 18.9 | 162.250 |
| 3 | 15875 | 4 | 58.582 | 18.9 | 144.250 |

transform (x)·10^5



NLI 002 1474

A Q U A   S U R V E Y   I N C.

**TEST ORGANISM ACCLIMATION & TRANSPORTATION**

DATE: 8-17-92    QA/QC: ______

TEST JOB #: 92-180    CLIENT: WRC

IN-LAB [ ✓ ]    MOBILE [ ]    SATELLITE [ ]

TEST SPECIES: C. tentans

Total Number of organisms acclimated: 405

AQUA SURVEY, INC Investigators: JM

A. **ORGANISMS**

1. ASI Culture/Holding [Tank/Receiving Log #]: Gen. Culture 92-0578
2. Procured From/Date Received: VOID
3. Age Information: Second instar larvae

B. **RECEIVING WATER PARAMETERS** (Non Cultured Organisms)

1. Temperature: VOID
2. Salinity:
3. Alkalinity:

C. **HOLDING** [ ] **CULTURE** [ ✓ ] **WATER PARAMETERS**

1. Temperature: 23 °C
2. Salinity: —
3. Alkalinity: Alk - 30-50
4. Water Source: 100% Recon

D. **ACCLIMATION** [Temperature - Water Type]

1. Acclimation Chamber Volume (Liters): ______
2. Acclimation Water Type: ______
3. Acclimation Water Temperature: ______
4. Acclimation Water Salinity: VOID ______
5. Acclimation Commencement - Date: ______ Time: ______
6. Change-Over Rate (ml/minute): ______
7. Culture Acclimation Ending-Date: ______ Time: ______
8. ______ Acclimation Ending-Date: ______ Time: ______

E. **TRANSFER CUSTODY & TRANSFER WATER PARAMETERS**

1. Culture Lab > Test Lab: -Date: 8-17-92 Time: 0830
2. Temperature: 23 °C
3. Salinity: —
4. Alkalinity: Alk 30-50
5. Culture Lab Technician Initials: JM [Transfer]
6. Test Lab Technician Initials: [Receiving]

**REMARKS:** 14 day Sediment Bioassay(s)

NLI 002 1475

Roy F. Weston, Inc.
REAC, Edison, NJ
EPA Contract 68-03-3482
**CUSTODY SEAL**

8/12/92
DATE

W. Van[illegible]
SIGNATURE

Roy F. Weston, Inc.
REAC, Edison, NJ
EPA Contract 68-03-3482
**CUSTODY SEAL**

8/12/92
DATE

W. Van[illegible]
SIGNATURE

FEDERAL EXPRESS [redacted]

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL
PACKAGE TRACKING NUMBER 5751960406

5751960406

**RECIPIENT'S COPY**

1 [redacted] Date 8/12/92

From (Your Name) Please Print | Your Phone Number (Very Important)

Company | Department/Floor No.
ROY F WESTON INC

Street Address
WOODBRIDGE AVE

City | State | ZIP Required
EDISON | NJ

2 To (Recipient's Name) Please Print | Recipient's Phone Number (Very Important)

Company | Department/Floor

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.)

City | State | ZIP Required

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City | State | ZIP Required

3 PAYMENT 1 Bill Sender 2 Bill Recipient's FedEx Acct No. 3 Bill 3rd Party FedEx Acct No. 4 Bill Credit Card
5 Cash/Check [redacted]

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
- 11 ☑ YOUR PACKAGING
- 16 ☐ FEDEX LETTER*
- 12 ☐ FEDEX PAK*
- 13 ☐ FEDEX BOX
- 14 ☐ FEDEX TUBE

Standard Overnight (Delivery by next business afternoon)
- 51 ☐ YOUR PACKAGING
- 56 ☐ FEDEX LETTER*
- 52 ☐ FEDEX PAK*
- 53 ☐ FEDEX BOX
- 54 ☐ FEDEX TUBE

Economy Two-Day (Delivery by second business day)
- 30 ☐ ECONOMY

Government Overnight (Restricted for authorized users only)
- 46 ☐ GOVT LETTER
- 41 ☐ GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
- 70 ☐ OVERNIGHT FREIGHT**
- 80 ☐ TWO-DAY FREIGHT**

†Delivery commitment may be later in some areas
*Declared Value Limit $500
**Call for delivery schedule

5 DELIVERY AND SPECIAL HANDLING (Check services required)
- 1 ☐ HOLD FOR PICK-UP (Fill in Box H)
- 2 ☐ DELIVER WEEKDAY
- 3 DELIVER SATURDAY (Extra charge) (Not available to all locations) ☐
- 4 ☐ DANGEROUS GOODS (Extra charge)
- 5 ☐
- 6 ☐ DRY ICE ______ Lbs
- 7 ☐ OTHER SPECIAL SERVICE
- 8 ☐
- 9 ☐ SATURDAY PICK-UP (Extra charge)
- 10 ☐
- ☐
- 12 ☐ HOLIDAY DELIVERY (If offered) (Extra charge)

6

| Packages | Weight In Pounds Only | Your Declared Value |
|---|---|---|
| 1 | 58 | |
| Total | Total 58 | Total |

DIM SHIPMENT (Chargeable Weight) ☐ lbs.
L x W x H

Received At
1 ☐ Regular Stop 3 ☐ Drop Box
2 ☐ On-Call Stop 4 ☐ B.S.C. 5 ☐ Station

Emp. No. | Date
☐ Cash Received
☐ Return Shipment
☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold
Street Address
City | State | Zip
Received By:
X
Date/Time Received | FedEx Employee Number

7 Release Signature:

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 2/92
FORMAT #126
126
PRINTED IN U.S.A.



NLI 002 1476

**Roy F. Weston, Inc.**
REAC, Edison, N.J.
EPA Contract 68-03-3482

## CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6756

SHEET NO. 1 OF

Project Name: NATIONAL LEAD PHASE 2
Project Number: 3347-31-01-4643
RFW Contact: P. BOLWITZ → DEBBIE WEEKS Phone (908) 632-9200

SAMPLE IDENTIFICATION / ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | TOX | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | F,G 14662 | 2 | SD | 8/11/92 | 2 | 32oz / 4°C | ✓ | | | |
| | F,G 14663 | 4 | SD | ↓ | 2 | ↓ | ✓ | | | |
| | F,G 14664 | 5 | SD | | 2 | | ✓ | | | |
| | F,G 15875 | 8 | SD | | 2 | | ✓ | | | |
| | F,G 15876 | 9 | SD | | 2 | | ✓ | | | |

48

Matrix:
SD - Sediment, DS - Drum Solids, DL - Drum Liquids, X - Other
PW - Potable Water, GW - Groundwater, SW - Surface Water, SL - Sludge
S - Soil, W - Water, O - Oil, A - Air

Special Instructions:
ANALYZE ACCORDING TO RFP REVISION 1

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/Analysis | W. VanDonen | 8/12/92 | W. Scott Vaughn | 8/13/92 | 10:30am | | | | | | |

NL 002 1477 N

96 HR. FRESHWATER SCREENING TEST

JOB # 92-110 WPC  CLIENT: WESTON - REAC  TEST SPECIES: C. tentans

START DATE: 19 Aug 92  END DATE: 23 Aug 92  TEST TEMPERATURE: 22±2°C

START TIME: 15:35  END TIME: 12:00  TEST WATER: Recon  TEST VOLUME: 200 ml

| SAMPLE ID | LIVE COUNTS | | | | | TEMPERATURE °C | | | | | D. O. mg/L | | | | | pH | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 00 | 24 | 48 | 72 | 96 | 00 | 24 | 48 | 72 | 96 | 00 | 24 | 48 | 72 | 96 | 00 | 24 | 48 | 72 | 96 |
| CONTROL A | 10 | 9[1] | | 9 | 8 | 22.5 | 22.0 | 19.0 | 22.0 | 22.0 | 7.4 | 4.2 | 6.7 | ① ~~6.8~~ | 5.9 | 6.4 | 6.2 | 6.5 | 7.1 | 7.1 |
| CONTROL B | 10 | 10 | | 10 | 10 | 22.5 | 22.0 | 19.0 | 22.0 | 22.0 | 7.4 | 5.4 | 8.1 | ② ~~6.7~~ | 5.0 | 6.4 | 6.2 | 6.8 | 7.1 | 7.1 |
| 3.2 A | 10 | 10 | | 7[3] | 6 | 22.5 | 22.5 | 19.5 | 22.0 | 22.0 | 7.4 | 7.2 | 8.1 | ③ ~~6.7~~ | 5.8 | 6.4 | 6.4 | 6.7 | 7.1 | 6.9 |
| B | 10 | 10 | | 8[2] | 4[3] | 22.5 | 22.5 | 19.5 | 22.0 | 22.0 | 7.4 | 6.3 | 8.2 | ④ ~~6.7~~ | 6.2 | 6.4 | 6.4 | 6.7 | 7.0 | 6.9 |
| 6.4 A | 10 | 10 | | 7[3] | 5[2] | 22.5 | 22.5 | 19.0 | 22.0 | 22.0 | 7.4 | 6.6 | 8.4 | 7.6 | 6.2 | 6.4 | 6.4 | 6.6 | 6.8 | 6.8 |
| B | 10 | 10 | | 5[5] | 3[2] | 22.5 | 22.5 | 19.0 | 22.0 | 22.0 | 7.4 | 6.6 | 8.2 | 7.4 | 6.2 | 6.4 | 6.4 | 6.6 | 6.8 | 6.8 |
| 12.8 A | 10 | 9[1] | | 2[7] | 2[1] | 22.5 | 22.5 | 19.0 | 22.0 | 22.0 | 7.4 | 6.0 | 8.4 | 6.8 | 5.6 | 6.3 | 6.4 | 6.6 | 6.7 | 6.7 |
| B | 10 | 7[2] | | 4[4] | 2 | 22.5 | 22.5 | 19.0 | 22.0 | 22.0 | 7.4 | 7.0 | 8.2 | 7.3 | 6.0 | 6.3 | 6.4 | 6.6 | 6.7 | 6.7 |
| 25.6 A | 10 | 9[1] | | 1 | 0[1] | 22.5 | 22.5 | 19.0 | 22.0 | 22.0 | 7.4 | 7.3 | 8.6 | 6.3 | 5.8 | 6.3 | 6.4 | 6.6 | 6.6 | 6.6 |
| B | 10 | 5[5] | | 0 | — | 22.5 | 22.5 | 19.0 | 22.0 | — | 7.4 | 7.7 | 8.6 | 7.5 | — | 6.3 | 6.4 | 6.5 | 6.6 | — |
| 51.2 A | 10 | 3[7] | | 0 | — | 22.5 | 22.5 | 19.5 | 22.0 | — | 7.4 | 7.4 | 8.8 | 7.8 | — | 6.2 | 6.4 | 6.6 | 6.6 | — |
| B | 10 | 6[4] | | 0 | - | 22.5 | 22.5 | 19.5 | 22.0 | — | 7.4 | 7.5 | 8.9 | 8.0 | — | 6.2 | 6.4 | 6.6 | 6.6 | — |
| DATE | 8/19 | 8/20 | | 8/22 | 8/23 | 8/19 | 8/20 | 8/21 | 8/22 | 8/23 | 8/19 | 8/20 | 8/21 | 8/22 | 8/23 | 8/19 | 8/20 | 8/21 | 8/22 | 8/23 |
| INITIALS | SY | SD | | SD | SD | SY | SY | TP/CN | SD | SD | SY | SY | TP/CN | SL | SD | SY | SY | TP/CN | [illegible] | SD |

① 7.8
② 7.7
③ 7.7
④ 7.7

VOID

| SAMPLE ID | CONDUCTIVITY µmhos | | | | | ALKALINITY mg/L CaCO3 | | | | | HARDNESS mg/L CaCO3 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 00 | 24 | 48 | 72 | 96 | 00 | 24 | 48 | 72 | 96 | 00 | 24 | 48 | 72 | 96 |
| CONTROL A | | | | | | | | | | | | | | | |
| CONTROL B | | | | | | | | | | | | | | | |
| 3.2 A | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | |
| 6.4 A | | | | | | | | | | | | | | | |
| ~~12.8~~ 6.4 B | | | | | | | | | | | | | | | |
| 12.8 A | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | |
| 25.6 A | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | |
| 51.2 A | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | |
| DATE | | | | | | | | | | | | | | | |
| INITIALS | | | | | | | | | | | | | | | |

FWSCR96

96 Hour LC50 C. tentans SRT CdCl

| Conc. | Number Exposed | Number Resp. | Observed Proportion Responding | Adjusted Proportion Responding | Predicted Proportion Responding |
|---|---|---|---|---|---|
| 3.2000 | 20 | 10 | 0.5000 | 0.5000 | 0.4204 |
| 6.4000 | 20 | 12 | 0.6000 | 0.6000 | 0.6735 |
| 12.8000 | 20 | 16 | 0.8000 | 0.8000 | 0.8643 |
| 25.6000 | 20 | 20 | 1.0000 | 1.0000 | 0.9600 |
| 51.2000 | 20 | 20 | 1.0000 | 1.0000 | 0.9918 |

Chi - Square Heterogeneity = 2.716

Mu = 0.598099
Sigma = 0.462828

| Parameter | Estimate | Std. Err. | 95% Confidence Limits |
|---|---|---|---|
| Intercept | 3.707727 | 0.453084 | ( 2.819682, 4.595773) |
| Slope | 2.160631 | 0.490294 | ( 1.199656, 3.121607) |

Theoretical Spontaneous Response Rate = 0.0000



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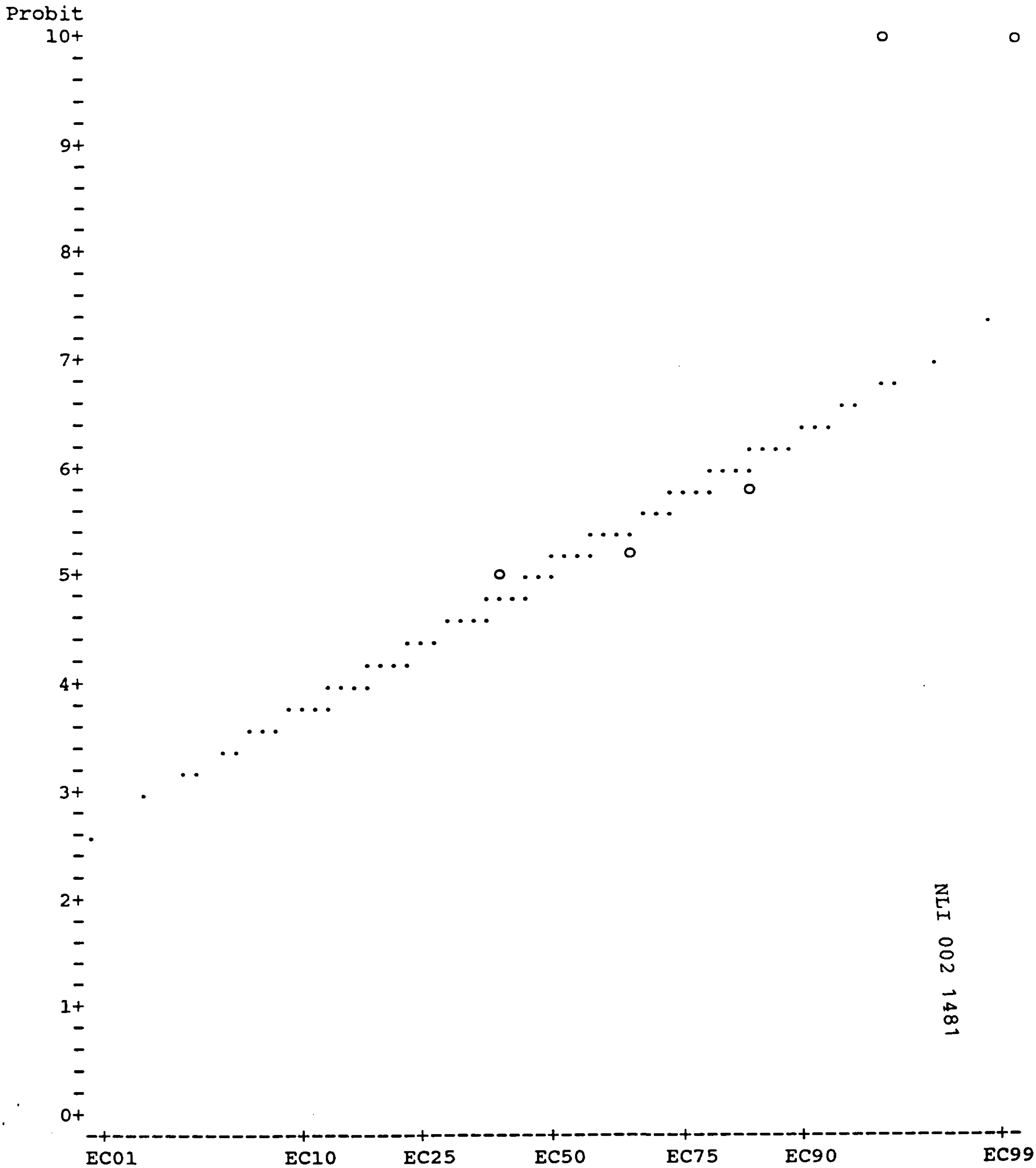
Estimated EC Values and Confidence Limits

| Point | Conc. | Lower 95% Confidence Limits | Upper 95% Confidence Limits |
|---|---|---|---|
| EC 1.00 | 0.3322 | 0.0269 | 0.8960 |
| EC 5.00 | 0.6867 | 0.0982 | 1.4996 |
| EC10.00 | 1.0114 | 0.1952 | 1.9803 |
| EC15.00 | 1.3135 | 0.3096 | 2.3947 |
| EC50.00 | 3.9637 | 2.0523 | 5.6722 |
| EC85.00 | 11.9612 | 8.4526 | 21.6233 |
| EC90.00 | 15.5331 | 10.6228 | 33.0075 |
| EC95.00 | 22.8773 | 14.4741 | 63.6032 |
| EC99.00 | 47.2907 | 24.8460 | 226.5139 |

PLOT OF ADJUSTED PROBITS AND PREDICTED REGRESSION LINE



SRT - $CdCl_2$ ~~6/9/92~~ 8/19/92 ~~E. estuarius~~ C. tentans

STOCK SOLUTION; 250 ppm - 100 mg of $CdCl_2$ (SIGMA LOT 98F-0054) IN A TOTAL VOLUME OF 200 ml USING DILUTION WATER (MANASQUAN)

| Conc Cd (ppm) | Stock (mls) | Total Vol. (mls) |
|---|---|---|
| ~~1.6~~ | ~~3.20~~ | ~~500~~ |
| 3.2 | 6.40 | 500 |
| 6.4 | 12.80 | 500 |
| 12.8 | 25.60 | 500 |
| 25.6 | 51.20 | 500 |
| 51.2 | 102.40 | 500 |

# AQUA SURVEY INC.

## TEST ORGANISM TRANSPORTATION FORM

DATE: 8-19-92

TEST JOB #: 92-180 CLIENT: SRT (WRC)

TEST LOCATION: IN-LAB [✓] FIELD [ ]

TEST SPECIES: C. tentans
Total Number of Organisms Transferred: 120
AQUA SURVEY, INC. Culture Laboratory Investigators: JM

A. ORGANISMS

1. ASI Culture/Holding Unit: Gen. Culture 92-0596
2. Receiving Log #: void
3. Culture Lot #: N/A
4. Age/Size Information: Second Instar Larvae

B. HOLDING [ ] CULTURE [✓] WATER PARAMETERS

1. Temperature: 23.5°C
2. Salinity: N/A
3. Water Source: 100% EPA Recon

C. TRANSFER CUSTODY & TRANSFER

1. Livestock Relinquishment Date: 8/19 Time: ____ By: JM
2. Livestock Receiving Date: 8/19 Time: ____ By: SW
3. Culture Manager or Lead Culturist Initials: JM

REMARKS: Logged 8/24/92



NLI 002 1483



asi 499 Point Breeze Road • Flemington New Jersey 08822 • Telephone (908)

# Appendix C

APPENDIX C
O'Brien and Gere RI Sediment Analytical Results
National Lead Site

/bovitz/fr-4643

NLI 002 1485

Table 8
National Smelting of New Jersey, Inc./
NL Industries, Inc. Site
Surface Water and Sediments Analyses (1988)

| SAMPLE ID | LOCATION ID | SAMPLE DATE | SAMPLE TYPE | FLOW STATE | pH | LEAD (1) (mg/l) |
|---|---|---|---|---|---|---|
| T0043 | 401 | 8/19/88 | water | low | 6.00 | 0.098 |
| T0043 | 401 | 8/19/88 | water | low | N/A | 0.114 |
| T0044 | 402 | 8/19/88 | water | low | 4.00 | 1.240 |
| T0045 | 403 | 8/19/88 | water | low | 4.00 | 0.263 |
| T0046 | 405 | 8/19/88 | water | low | 5.50 | 0.025 |
| T0047 | 406 | 8/19/88 | water | low | 6.00 | 0.011 |
| T0138 | 401 | 9/13/88 | water | high | 5.30 | 0.1 |
| T0124 | 402 | 9/13/88 | water | high | 3.40 | 1.06 |
| T0136 | 403 | 9/13/88 | water | high | 3.30 | 0.088 |
| T0126 | 404 | 9/13/88 | water | high | 3.00 | 2.18 |
| T0134 | 405 | 9/13/88 | water | high | 3.60 | 0.021 |
| T0132 | 406 | 9/13/88 | water | high | 6.40 | 0.0117 |
| T0103 | 408 | 9/13/88 | water | high | 3.50 | 3 |
| T0101 | 409 | 9/13/88 | water | high | 3.40 | 1.98 |
| T0099 | 411 | 9/13/88 | water | high | 4.30 | 0.0232 |
| T0139 | 401 | 9-13-88 | sediment | | | 817 |
| T0125 | 402 | 9-13-88 | sediment | | | 1640 |
| T0137 | 403 | 9-13-88 | sediment | | | 3060 |
| T0127 | 404 | 9-13-88 | sediment | | | 702 |
| T0135 | 405 | 9-13-88 | sediment | | | 4350 |
| T0133 | 406 | 9-13-88 | sediment | | | <5 |
| T0102 | 408 | 9-13-88 | sediment | | | 286 |
| T0100 | 409 | 9-13-88 | sediment | | | 552 |
| T0098 | 411 | 9-13-88 | sediment | | | 77.5 |

NOTE: N/A - Not Analyzed
(1) mg/kg for sediment

NLI 002 1486

Table 9
National Smelting of New Jersey, Inc./
NL Industries, Inc. Site
Surface Water Quality Analyses (1989)

| SAMPLE ID | LOCATION ID | SAMPLE DATE | LEAD (mg/l) | ANTIMONY (mg/l) | ARSENIC (mg/l) | CADMIUM (mg/l) | CHROMIUM (mg/l) | COPPER (mg/l) | SELENIUM (mg/l) | ZINC (mg/l) | TIN (mg/l) | SULFATE (mg/l) | CHLORIDE (mg/l) | pH | CONDUCTIVITY (umhos/cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J2611 | ES-1 | 10/17/89 | J.010 | | | | | | | | | 600 | 230 | 7.2 | 2200 |
| J2612 | ES-2 | 10/17/89 | R | | | | | | | | | 100 | 55 | 7.3 | 450 |
| J2618 | ES-3 | 10/17/89 | R | | | | | | | | | 57 | <25 | 7.4 | 120 |
| J2615 | ES-5 | 10/17/89 | R | | | | | | | | | 30 | <25 | 7.2 | 260 |
| J2609 | ES-6 | 10/17/89 | .101 | | | | | | | | | 19 | <25 | 7.3 | 110 |
| J2617 | ES-7 | 10/17/89 | R | | | | | | | | | 73 | <25 | 7.2 | 120 |
| J2606 | WS-1 | 10/16/89 | J.049 | | | | | | | | | 170 | <25 | 7.0 | 430 |
| J2607 | WS-2 | 10/16/89 | J.069 | | | | | | | | | 170 | <25 | 7.1 | 415 |
| J2608 | WS-3 | 10/16/89 | J.085 | | | | | | | | | 180 | <25 | 7.2 | 420 |
| J2602 | WS-4 | 10/16/89 | J.064 | | | | | | | | | 170 | <25 | 7.1 | 520 |
| J2601 | WS-5 | 10/16/89 | .313 | | | | | | | | | 230 | <25 | 7.0 | 680 |
| J2604 | WS-6 | 10/16/89 | J.078 | | | | | | | | | 240 | <25 | 7.0 | 700 |
| J2603 | WS-7 | 10/16/89 | .408 | | | | | | | | | 1,200 | <25 | 6.7 | 3200 |
| J2600 | WS-8 | 10/16/89 | .414 | | | | | | | | | 740 | <25 | 6.6 | 900 |
| J2597 | WS-9 | 10/16/89 | 1.270 | J.079 | .060 | .014 | .016 | .039 | J<.010 | .162 | <.800 | 460 | <25 | 6.6 | 1200 |
| J2605 | WS-11 | 10/16/89 | .190 | | | | | | | | | 34 | <25 | 6.9 | 220 |
| J2624 | WS-12 | 10/17/89 | J2.200 | | | | | | | | | 9 | <25 | 7.2 | 130 |
| J2610 | WS-16 | 10/17/89 | .244 | | | | | | | | | 140 | <25 | 7.2 | 340 |
| J2616 | WS-17 | 10/17/89 | J.418 | | | | | | | | | 140 | <25 | 7.4 | 360 |

Note: R = Indicates data rejected based on data validation
J = Indicates results should be considered approximate

Table 10-1
National Smelting of New Jersey, Inc./
NL Industries, Inc. Site
Surface Water Sediment Sample Analyses (1989)

| Sample ID | Location | Date | Lead (mg/kg) | Sample ID | Location | Date | Lead (mg/kg) |
|---|---|---|---|---|---|---|---|
| J3043 | ES-1 (0-3) | 10/17/89 | 13.9 | J3074 | WS-7 (0-3) | 10/16/89 | J1870.0 |
| J3046 | (3-6) | 10/17/89 | 21.8 | J3075 | (3-6) | 10/17/89 | J5540.0 |
| J3047 | (6-8) | 10/17/89 | 28.2 | J3076 | (6-12) | 10/17/89 | J235.0 |
| J3043 | ES-2 (0-3) | 10/17/89 | 251.0 | J3077 | (12-19) | 10/17/89 | J8.6 |
| J3044 | (3-4) | 10/17/89 | 49.4 | J3036 | WS-8 (0-3) | 10/16/89 | J1310.0 |
| J3061 | ES-3 (0-3) | 10/17/89 | 22.8 | J3037 | (3-6) | 10/16/89 | 490.0 |
| J3062 | (3-6) | 10/17/89 | 20.8 | J3038 | (6-9) | 10/16/89 | 19.6 |
| J3080 | ES-4 (0-3) | 10/17/89 | J628.0 | J3029 | WS-9 (0-3) | 10/16/89 | J6403.9 |
| J3081 | (3-6) | 10/17/89 | J177.0 | J3030 | (3-6) | 10/16/89 | 899.1 |
| J3082 | (6-11) | 10/17/89 | J39.7 | J3031 | (6-9) | 10/16/89 | 28.9 |
| J3060 | ES-5 (0-3) | 10/17/89 | J206.0 | J3055 | WS-10 (0-3) | 10/17/89 | J2470.0 |
| J3063 | ES-6 (0-3) | 10/17/89 | 36.9 | J3056 | (3-6) | 10/17/89 | J247.0 |
| J3064 | (3-6) | 10/17/89 | 73.0 | J3057 | (6-12) | 10/17/89 | J61.5 |
| J3065 | (6-10) | 10/17/89 | 159.0 | J3058 | (12-20) | 10/17/89 | J13.9 |
| J3066 | ES-7 (0-3) | 10/17/89 | 536.0 | J3098 | WS-11 (0-3) | 10/16/89 | J23700.0 |
| J3067 | (3-6) | 10/17/89 | 44.4 | J3099 | (3-6) | 10/16/89 | 59700.0 |
| J3068 | (6-8) | 10/17/89 | J38.3 | J3100 | (6-10) | 10/16/89 | 702.0 |
| J3039 | WS-1 (0-3) | 10/16/89 | J1350.0 | J3048 | WS-12 (0-3) | 10/17/89 | J1860.0 |
| J3040 | (3-6) | 10/16/89 | J551.0 | J3049 | (3-6) | 10/17/89 | 589.0 |
| J3041 | (6-12) | 10/16/89 | J225.0 | J3050 | (6-10) | 10/17/89 | 140.0 |
| J3042 | (12-20) | 10/16/89 | J14.6 | J3083 | WS-13 (0-3) | 10/17/89 | J171.0 |
| J3032 | WS-2 (0-3) | 10/16/89 | J2800.0 | J3084 | (3-6) | 10/17/89 | J50.0 |
| J3033 | (3-6) | 10/16/89 | J542.0 | J3085 | (6-12) | 10/17/89 | J31.0 |
| J3034 | (6-12) | 10/16/89 | J180.0 | J3086 | (12-16) | 10/17/89 | J9.6 |
| J3035 | (12-15) | 10/16/89 | J357.0 | J3087 | WS-14 (0-3) | 10/17/89 | J275.0 |
| J3091 | WS-3 (0-3) | 10/16/89 | J816.0 | J3088 | (3-6) | 10/17/89 | 2870.0 |
| J3092 | (3-6) | 10/16/89 | J2220.0 | J3089 | (6-12) | 10/17/89 | 145.0 |
| J3093 | (6-12) | 10/16/89 | J329.0 | J3090 | (12-17) | 10/17/89 | 8.7 |
| J3094 | (12-15) | 10/16/89 | 108.0 | J3071 | WS-15 (0-3) | 10/17/89 | J246.0 |
| J3051 | WS-4 (0-3) | 10/17/89 | J1970.0 | J3072 | (3-6) | 10/17/89 | J1380.0 |
| J3052 | (3-6) | 10/17/89 | J1570.0 | J3073 | (6-8) | 10/17/89 | J250.0 |
| J3053 | (6-12) | 10/17/89 | J400.0 | J3078 | WS-16 (0-3) | 10/17/89 | J1590.0 |
| J3054 | (12-18) | 10/17/89 | J72.4 | J3079 | (3-5) | 10/17/89 | J1600.0 |
| J3025 | WS-5 (0-3) | 10/16/89 | J1350.0 | J3095 | WS-17 (0-3) | 10/16/89 | J1890.0 |
| J3026 | (3-6) | 10/16/89 | J1000.0 | J3096 | (3-6) | 10/16/89 | 110.0 |
| J3027 | (6-12) | 10/16/89 | J72.5 | J3097 | (6-9) | 10/16/89 | 33.7 |
| J3028 | (12-14) | 10/16/89 | 18.5 | J3069 | DUP ES-2 (0-3) | 10/17/89 | J35.4 |
| J3059 | WS-6 (0-3) | 10/17/89 | J897.0 | J3070 | DUP ES-2 (3-5) | 10/17/89 | J15.3 |

Note: J indicates that data is considered approximate

Table 10-2
National Smelting of New Jersey, Inc./
NL Industries, Inc. Site
Supplemental Surface Water Sediment Analyses

| SAMPLE ID | LOCATION | SAMPLE DATE | LEAD | ANTIMONY (mg/kg) | ARSENIC (mg/kg) | CADMIUM (mg/kg) | CHROMIUM (mg/kg) | COPPER (mg/kg) | SELENIUM (mg/kg) | ZINC | TIN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| J3029 | WS-9 (0-3) | 10/16/89 | J6403.9 | J477.8 | J280.3 | J21.2 | J49.3 | J187.2 | J2.7 | J280.8 | J<394.1 |
| J3030 | WS-9 (3-6) | 10/16/89 | 899.1 | J113.8 | 62.0 | 4.2 | 18.3 | J73.4 | 0.7 | J69.7 | <146.8 |
| J3031 | WS-9 (6-9) | 10/16/89 | 28.9 | J30.4 | 3.8 | 2.0 | 9.1 | J33.4 | 0.5 | J12.2 | <121.6 |

Note: J - indicates data is approximate
Elevated detection limits are due to matrix interferences at the time of analysis

Table 10-1
National Smelting of New Jersey, Inc./
NL Industries, Inc. Site
Surface Water Sediment Sample Analyses (1989)

| Sample ID | Location | Date | Lead (mg/kg) | Sample ID | Location | Date | Lead (mg/kg) |
|---|---|---|---|---|---|---|---|
| J3043 | ES-1 (0-3) | 10/17/89 | 13.9 | J3074 | WS-7 (0-3) | 10/16/89 | J1870.0 |
| J3046 | (3-6) | 10/17/89 | 21.8 | J3075 | (3-6) | 10/17/89 | J5540.0 |
| J3047 | (6-8) | 10/17/89 | 28.2 | J3076 | (6-12) | 10/17/89 | J235.0 |
| J3043 | ES-2 (0-3) | 10/17/89 | 251.0 | J3077 | (12-19) | 10/17/89 | J8.6 |
| J3044 | (3-4) | 10/17/89 | 49.4 | J3036 | WS-8 (0-3) | 10/16/89 | J1310.0 |
| J3061 | ES-3 (0-3) | 10/17/89 | 22.8 | J3037 | (3-6) | 10/16/89 | 490.0 |
| J3062 | (3-6) | 10/17/89 | 20.8 | J3038 | (6-9) | 10/16/89 | 19.6 |
| J3080 | ES-4 (0-3) | 10/17/89 | J628.0 | J3029 | WS-9 (0-3) | 10/16/89 | J6403.9 |
| J3081 | (3-6) | 10/17/89 | J177.0 | J3030 | (3-6) | 10/16/89 | 899.1 |
| J3082 | (6-11) | 10/17/89 | J39.7 | J3031 | (6-9) | 10/16/89 | 28.9 |
| J3060 | ES-5 (0-3) | 10/17/89 | J206.0 | J3055 | WS-10 (0-3) | 10/17/89 | J2470.0 |
| J3063 | ES-6 (0-3) | 10/17/89 | 36.9 | J3056 | (3-6) | 10/17/89 | J247.0 |
| J3064 | (3-6) | 10/17/89 | 73.0 | J3057 | (6-12) | 10/17/89 | J61.5 |
| J3065 | (6-10) | 10/17/89 | 159.0 | J3058 | (12-20) | 10/17/89 | J13.9 |
| J3066 | ES-7 (0-3) | 10/17/89 | 536.0 | J3098 | WS-11 (0-3) | 10/16/89 | J23700.0 |
| J3067 | (3-6) | 10/17/89 | 44.4 | J3099 | (3-6) | 10/16/89 | 59700.0 |
| J3068 | (6-8) | 10/17/89 | J38.3 | J3100 | (6-10) | 10/16/89 | 702.0 |
| J3039 | WS-1 (0-3) | 10/16/89 | J1350.0 | J3048 | WS-12 (0-3) | 10/17/89 | J1860.0 |
| J3040 | (3-6) | 10/16/89 | J551.0 | J3049 | (3-6) | 10/17/89 | 589.0 |
| J3041 | (6-12) | 10/16/89 | J225.0 | J3050 | (6-10) | 10/17/89 | 140.0 |
| J3042 | (12-20) | 10/16/89 | J14.6 | J3083 | WS-13 (0-3) | 10/17/89 | J171.0 |
| J3032 | WS-2 (0-3) | 10/16/89 | J2800.0 | J3084 | (3-6) | 10/17/89 | J50.0 |
| J3033 | (3-6) | 10/16/89 | J542.0 | J3085 | (6-12) | 10/17/89 | J31.0 |
| J3034 | (6-12) | 10/16/89 | J180.0 | J3086 | (12-16) | 10/17/89 | J9.6 |
| J3035 | (12-15) | 10/16/89 | J357.0 | J3087 | WS-14 (0-3) | 10/17/89 | J275.0 |
| J3091 | WS-3 (0-3) | 10/16/89 | J816.0 | J3088 | (3-6) | 10/17/89 | 2870.0 |
| J3092 | (3-6) | 10/16/89 | J2220.0 | J3089 | (6-12) | 10/17/89 | 145.0 |
| J3093 | (6-12) | 10/16/89 | J329.0 | J3090 | (12-17) | 10/17/89 | 8.7 |
| J3094 | (12-15) | 10/16/89 | 108.0 | J3071 | WS-15 (0-3) | 10/17/89 | J246.0 |
| J3051 | WS-4 (0-3) | 10/17/89 | J1970.0 | J3072 | (3-6) | 10/17/89 | J1380.0 |
| J3052 | (3-6) | 10/17/89 | J1570.0 | J3073 | (6-8) | 10/17/89 | J250.0 |
| J3053 | (6-12) | 10/17/89 | J400.0 | J3078 | WS-16 (0-3) | 10/17/89 | J1590.0 |
| J3054 | (12-18) | 10/17/89 | J72.4 | J3079 | (3-5) | 10/17/89 | J1600.0 |
| J3025 | WS-5 (0-3) | 10/16/89 | J1350.0 | J3095 | WS-17 (0-3) | 10/16/89 | J1890.0 |
| J3026 | (3-6) | 10/16/89 | J1000.0 | J3096 | (3-6) | 10/16/89 | 110.0 |
| J3027 | (6-12) | 10/16/89 | J72.5 | J3097 | (6-9) | 10/16/89 | 33.7 |
| J3028 | (12-14) | 10/16/89 | 18.5 | J3069 | DUP ES-2 (0-3) | 10/17/89 | J35.4 |
| J3059 | WS-6 (0-3) | 10/17/89 | J897.0 | J3070 | DUP ES-2 (3-5) | 10/17/89 | J15.3 |

Note: J indicates that data is considered approximate

# Appendix D

APPENDIX D

U.S. EPA ERT/REAC Draft Small Mammal Standard Operating Procedures

National Lead Site

/bovitz/fr-4643

NLI 002 1492

# TABLE OF CONTENTS

## 1.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) document describes procedures for the sampling of small mammal populations. Due to their trophic position as consumers, small mammals can act as indicators of the effects of hazardous contamination on terrestrial and wetland communities[1]. Collected specimens may be used for analysis of (1) contaminant levels in body tissues, (2) histopathological effects of contaminants, (3) effects of contaminants on body condition, growth, and reproduction, and (4) potential impacts on population density and demographics.

## 2.0 METHOD SUMMARY

Before trapping, the area of potential impacts should be identified, and one or more reference areas selected with which to compare results. Permission should then be obtained for reference area access from the appropriate landowner, and a scientific collection permit should be obtained from the appropriate state agency.

The type of trap selected depends on the species desired, as well as the analyses and number of animals required. Live traps, such as the Sherman Box trap and Havahart trap are preferable for collection of animals for histopathological analysis. Traps which kill the animal upon capture, such as the Museum Special snap trap, may be used to augment trap success. Pitfall traps may be used to capture species such as shrews which are difficult to trap by alternative means.

Once the focal area of the study is determined, trap grid locations should be selected on the basis of habitat availability and evidence of small mammal activity. The location of each trap line, and number of traps on that line, should be marked in the field and on a corresponding map or aerial photo. All traps should be checked early in the morning and late in the day to avoid specimen tissue damage, and loss due to scavengers. Specimens collected will be marked with aluminum tags listing the trap location number, genus and species of the animal, date and collector's initials. They should then be stored within individual ziploc bags on ice until processing. Data sheets for each animal collected will be filled out when the animals are processed. Processing of specimens is described in Draft SOP, Small Mammal Dissection and Tissue Processing (in preparation).

## 3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING AND STORAGE

Any live specimens collected should be removed from the field and transported within the same trap to the laboratory or processing area. A replacement trap should be immediately set in place of the one removed. The location number of the trap removed should be written on an aluminum tag and attached to the trap. In the laboratory or processing area, live specimens should be killed by cervical dislocation immediately before processing. Individual animals should be killed as soon as they are removed from the trap. The aluminum tag should then be transferred from the trap to the animal. Any dead specimens collected in either live or kill traps should be tagged on the right hind foot for documentation purposes, and placed into individual ziploc bags. The specimens should be stored on ice in coolers until processing. Data sheets describing the location, and conditions under which each specimen was collected should be completed in the laboratory or processing area when the animals are processed.

All specimen processing, dissection, tissue preservation and storage procedures are described in Draft SOP, Small Mammal Dissection and Tissue Processing (in preparation).

## 4.0 INTERFERENCES AND POTENTIAL PROBLEMS

Trapping of small mammals may lead to mortality of endangered or threatened species. Thus, the appropriate state agency should be contacted in advance to determine if the latter have been recorded in the area of the site. If they have been recorded, then only live trapping methods should be used on site. Small mammal populations can become depleted, and community species composition can be altered if trapping is conducted for an extended period. Similarly, if populations become depleted, immigration could occur, meaning subsequent captures could include individuals which were not originally associated with the site. Thus, trapping should generally be limited to three consecutive nights, assuming trapping objectives are met.

Extreme temperature conditions can alter tissue characteristics of both live and dead animals, making tissue unsuitable for analysis, or biasing the analysis. Exposure of dead specimens to extreme cold for extended periods can cause tissue to freeze, making histopathological analysis difficult, and extreme heat can result in rapid decomposition of tissue. Similarly, live animals may overheat and/or become stressed from capture and retention in traps, causing them to utilize fat reserves, or otherwise influence body physiology. This could also bias both chemical and histopathological analyses. Therefore, intervals between trap checks should be shortened under such conditions.

Predators such as raccoons and foxes can destroy trap lines, and prey on animals captured. If this should occur, then large size (#3) Havahart traps should be set in an attempt to trap the predator and remove it. In some parts of the country, scavengers such as ants can rapidly consume specimens trapped overnight. In this situation, live trapping may have to be used exclusively in an attempt to reduce loss of specimens.

Statistical comparison of body weights, organ weights, and other metrics between areas of different contamination can be confounded with the age structure of the populations compared. Hence it is important to insure that comparisons of such parameters are made within age classes. Some species show readily identifiable differences in pelage which enable identification of age class in the field. For species whose age determination techniques are not described in the literature, eye lens weight curves, and/or metric techniques using sex organs may be developed to ascertain whether individuals captured are adults, subadults or juveniles.

In some cases, the specimen collected may provide insufficient body mass for analysis to a given detection limit. If this occurs, then individuals of the same species from locations within the same area of contamination may be pooled for analysis. If multiple analyses of contamination in tissues are required, these may have to be prioritized if specimens do not provide sufficient amounts of tissue to conduct all of the required analyses. Careful documentation should be made of which analyses should be conducted on each specimen, and the analytical laboratory informed.

## 5.0 EQUIPMENT/APPARATUS

| | | |
|---|---|---|
| work plan | wet ice | hand scale |
| maps | clipboard | 5 gal. plastic buckets |
| data sheets | first aid kit | large ziploc bags |
| compass | machete | 3/4" x 3 1/2" aluminum tags |
| tape measure | survey flags | small coolers |
| camera/film | surgical gloves | safety equipment as per health and safety plan |
| traps | bait | waterproof marker |
| rubber bands | duct tape | 15 centimeter ruler |

## 6.0 REAGENTS

Trapping does not involve the use of any reagents. Preparation and preservation procedures are described under Draft SOP, Small Mammal Dissection and Tissue Processing.

## 7.0 PROCEDURES

### 7.1 Office Preparation

Prior to fieldwork, obtain a scientific collection permit from the appropriate state and/or Federal agencies, and secure permission from local landowners if the reference area is to be located on private property. A period of approximately six weeks is normally required for this process.

If the target species are known *a priori*, information should be assembled on their life histories, aging techniques, and trapping techniques, and include a literature review if necessary. If the target species are not known *a priori*, then a literature review of distribution patterns, habitat requirements, and general abundance of species inhabiting the region of the site should be conducted. This information may be used in conjunction with site data to determine the species most likely to be encountered on site.

A Quality Assurance Work Plan (QAWP) describing study objectives, methodology and budget must be prepared in accordance with ERT/REAC SOP #2014, Preparation of Work Plans and Quality Assurance Work Plans for REAC Activations. A preliminary work plan or QAWP should be completed within five days of receipt of a work assignment. Pertinent background information such as topographic maps, soil survey maps, previous site reports, and aerial photographs should be reviewed at this stage. Analytical requirements, including tissue requirements, holding times and method detection limits for each analysis should be determined before the sampling plan is prepared. These should be discussed with the client, as well as quality assurance personnel, subcontracting laboratories, and other regulatory agencies or personnel involved. The final QAWP should include a sampling plan, and should be completed at least one week before initiating fieldwork to allow its contents to be reviewed by the field team. On projects where it is possible to conduct preliminary fieldwork, the sampling plan should be based on the results of that study.

Prepare field and analytical schedules and coordinate with staff, client and other regulatory authorities where appropriate.

Obtain necessary sampling and monitoring equipment (including equipment listed in Section 5.0). Ensure that all equipment has been decontaminated, and is in working order. Traps may be cleaned with tap water and scrub brushes should be used. All traps should be inspected, as adjustment of the sensitivity of the trap mechanism may be necessary.

An approved health and safety plan is required prior to fieldwork. Personnel handling small mammals should have had a tetanus shot within three years prior to sampling.

7.2 Field Preparation

Identify local suppliers of field expendables (e.g. wet and dry ice), and local drop-off points of overnight delivery services. Contact carrier services and confirm shipping requirements and restrictions for equipment and samples.

A general site survey should be conducted, in accordance with the Health and Safety Plan requirements.

Identify on-site sampling areas, and at least one reference area for comparison. The reference area selected should be as close as possible to the site, yet be outside of any site influences. It should also have similar habitat features to the study site, so that small mammal species composition is similar. The reference area should also be free of contamination. An example of a wetland reference would be a marsh located upstream of the site, within the same watershed.

Determine where and how specimens collected will be processed. This should be based upon field logistics, analyses required, as well as health and safety considerations.

7.3 Collection of Specimens

7.3.1 Determination of trapping method

The number and type of traps set, and number of trap nights should be determined in accordance with the study objectives. Since one of the primary objectives of most studies will be histopathological analysis of animal tissues, live trapping methods are preferred. This is because tissue characteristics are less likely to change in a live animal than in a specimen which has been dead for several hours before collection. Alternative trapping methods such as snap trapping or pitfall trapping may be used to supplement the number of animals collected, especially if trapping success is low.

The type of trap used should be appropriate to the target species. This can be determined by a literature review, and upon the basis of past experience. Several trapping techniques may be employed if a variety of species are to be investigated, or if information on species diversity and abundance is required.

If possible, a preliminary study should be conducted at least two weeks before the actual field study, in order to obtain preliminary data on potential target species. Target species, and sample design, including level of sampling effort, should be based on the results of this study. During the preliminary study, the site should be trapped with a variety of traps, to determine which species are present as well as which trapping technique is most effective for a given species. The number of trap nights in this study should be determined by the area of the site, the diversity of habitat types present, and trapping success during the first night. It is generally recommended that no more than 100 traps per acre of prime habitat be set during this initial study, in order to avoid depletion of populations. Prime habitat as defined here consists of areas having dense herbaceous cover or fallen brush, and/or show evidence of animal activity such as runways, holes in the ground, scat, vegetation cuttings, or nest material. The availability of fruiting trees or shrubs, weed seeds, or mast crops may also augment habitat suitability in areas of lesser cover.

In areas of lesser habitat quality, sampling at this level of effort could deplete local populations. As an alternative, traps can be set in areas outside of the primary focus of the study, such as around the periphery of the site. During the preliminary study, efforts should be made to minimize the level of disturbance to vegetation in the area.

Once the target species and trapping method are determined, a sampling design should be developed for the actual study. This design should be described within a sampling plan, reviewed and discussed in advance by the Task Leader, Work Assignment Manager, project statistician, and Analytical Laboratory representative. This sampling plan should be incorporated into the QAWP to insure that numbers of specimens collected, locations of trap grids, etc. are consistent with analytical requirements, such as detection limits. This will also help to insure that the small mammal sampling is coordinated with other objectives of the study, such as soil or vegetation sampling.

7.3.2 Sampling Effort

Sampling effort should be based upon the area of the site investigated. As a guideline, approximately 300 traps per acre of prime habitat should be set. The standard duration of the study should be three sampling nights. Sample effort may be adjusted during the course of the study in order to meet study objectives. If different areas are to be compared, such as the site versus the reference area, or different contamination areas within the site, then trapping effort should be expended with the objectives of achieving equal trap success between areas in order to facilitate data analysis and interpretation. If the areas compared are of similar, relatively homogenous habitat, then this may be achieved by expending equal trap effort per area (Figure 1, Appendix A).

7.3.3 Trap placement and marking

Before leaving for the field, traps should be counted and apportioned into five-gallon plastic buckets, with the number of traps in each bucket written on a piece of duct tape attached to the bucket handle. If traps are transferred from one bucket to another, the "new" number of traps should be written on both buckets. This is important for maintaining a trap inventory, as well as setting out the correct number of traps to meet the study objectives.

To facilitate relocation and documentation, traps should be set in grids wherever possible. Grids should be established in areas of suitable habitat for the target species investigated. If the target species is an edge specialist, trap lines within the grid should be run parallel to the general compass orientation of the treeline.

If comparisons are to be made between areas of different contaminant concentrations, then the location of these areas should be verified in the field before trap placement. This can be done by measuring the distance of the contaminated area from a known landmark shown on the site map or aerial photo. Depending upon the accuracy required, a measuring tape may be used, or points can be surveyed using surveying equipment.

The beginning and end traps along each grid line should be marked with a survey flag and/or length of flagging tied to a branch at eye level. The flag or flagging should be labelled with the trap line number and trap number, using a thick (½") waterproof marker. In addition, every other trap should be flagged to facilitate trap relocation (Figure 2, Appendix A), unless the traps are set in an open area where they are readily visible. In heavily vegetated areas such as wetlands or fields, individual trap locations may also be marked with a survey flag. This will facilitate trap relocation, as well as documentation of successful captures.

Grids should consist of a series of parallel trap lines spaced 10 feet apart, with each line having a consistent number of traps (Figure 2). This will also facilitate documentation of captures, since in most cases every single trap will not be marked with a survey flag. Along each line, traps should be placed ten feet apart as follows. At the beginning of each line, the individual setting traps should label and place the first flag, and drop the trap to be set. Thereafter the person should pace a distance of 10 feet in a straight line, and drop the next trap, then do so again, until all of the traps are dropped. Each individual who is trapping is responsible for insuring that the distance between traps equals 10 feet, by measuring their pace in advance. At every other trap location, a surveying flag should be dropped, unless the ground is bare throughout the area. In any case, the last trap should be flagged as well. Once the line of traps has been dropped, the person should walk along the trap line in the opposite direction, and bait and set each trap. By adhering to this technique the amount of habitat disturbance will be minimized.

After each trap is set, if its location is to be marked, then a flag should be placed as close as possible to the trap, but not further than six inches away. Flags should be placed so that they do not impede an animal's progress toward the trap.

Each trap line should be assigned its own unique number. Trap lines should be numbered sequentially, preferably according to their location within the grid, being as consistent as possible (Figure 1). If the situation allows, it is preferable that "low" numbers be at one end of the site, and high numbers be at the other end.

Each individual trap along the trap line should be assigned a number, based upon its position along the line. For example, if the trap line is ten traps long, it should be numbered from one to ten. Individual traps should be numbered so that low numbers are consistently located toward one end of the trap line (Figure 2). For example, trap location number 7-3 would denote the third trap along trap line seven. This numbering system should be used consistently throughout the site, as well as at the reference area, in order to make trap locations easier to remember. Once an animal is trapped, the identification tag attached to it will list the line number and trap number, as well as the genus and species of the animal trapped, collector's initials and the date.

The location and orientation of each trap grid should be noted in field logbooks, and on a single "master copy" of a map or aerial photo of the site. The simpler the sampling design, the easier it is to locate and document successful captures, and to pick up traps at the end of the study. If the number of traps should differ between grids, this should be noted in logbooks and on the map as well. However, this situation should be kept to a minimum.

7.3.4 Trap Setting

The technique of setting traps will depend upon the type of trap being set, although traps should always be set so that their release will not be impeded by vegetation or other obstructions. Specific instructions for the most commonly used trap types are described below. Once the trap is set, it should not be moved, even if it is consistently unsuccessful. This is to avoid loss of traps from team members moving traps without the knowledge of the other members. If trap success is low, traps will be added on a per grid basis under direction of the Work Assignment Manager or Task Leader.

Museum Special Traps

Museum Special traps are snap traps designed to kill the animal immediately. They measure 5 1/2" x 2 3/4" and are generally used for small mammals the size of mice and voles (Figure 3, Appendix A). Each trap should be baited in the field before setting. The bait should consist of a mixture of approximately 50% peanut butter and 50% rolled oats. The relative proportions of each can be modified in the field to suit conditions, e.g. in warm weather use less peanut butter, since it melts. The bait mixture should be carried in a ziploc bag and dispensed as needed. When setting traps, it is generally more efficient if each person carries their own bait bag. Traps should be baited as they are set, not ahead of time, so that the bait does not fall off.

Traps should be set along trap lines at 10 foot intervals, but individual traps should be placed in areas most likely used by small mammals. Some species, such as voles, leave definite runways in grassy habitat, in which traps can be set. Runways or other animal paths should be inspected carefully for evidence of fresh cuttings, feces, or other signs of animal activity, and traps placed accordingly in order to maximize trap success. Other species may not use runways, but traps can still be set to increase the likelihood of success. Traps should seldom be set in open areas, since these are usually avoided by small mammals due to the increased likelihood of predation. In some cases, such as desert environments, this may be unavoidable. Nevertheless, success can still be increased by placing traps along fallen logs, large roots, or in brushy areas. Care should be taken not to set individual traps more than one foot off of the trap line in any direction, in order to keep the trap line straight.

Traps should be placed so that the trap release will not be impeded by vegetation. Also, traps should be set so that the pin is set under the treadle toward the "fast" release end. This is generally located at the left side of the treadle.

Victor Traps

Victor traps are similar to Museum Special traps (Figure 3), but they are smaller in size (4" x 1 7/8"). Trap placement is similar to that of Museum Special traps. Unlike the Museum Special, the speed of the release mechanism is generally not adjustable by treadle placement. However, the sensitivity of the release can be increased by bending the trap pin slightly so that it releases from the treadle more easily. Victor traps should be used for smaller mice and shrews. If shrews are among the target species, they should be baited with a mixture of 50% bacon fat or melted suet, and 50% peanut butter mixed with rolled oats. If shrews are required exclusively, then the traps may be baited with 100% bacon fat or suet. During summer months, paraffin may be added to the bacon fat to increase its melting point.

Sherman Traps

Sherman traps (Figure 4, Appendix A) are lightweight aluminum box traps available in several sizes, and are designed to capture animals live. Because of this, they may be especially useful in capturing animals for histopathological analysis, since post-mortem autolysis of tissue will be avoided. Moreover, Sherman traps are useful in preliminary studies designed to determine which species are present in an area, since animals may be released. Thus local populations will not be depleted, and sufficient numbers of animals may still be available for the main study. Sherman traps are also collapsible and easy to transport. They are generally baited with a small amount (about 1/2 teaspoon) of rolled oats or granola.

When set, Sherman traps are open on one end only. Before setting Sherman traps, it is essential to check the effectiveness of the release mechanism by experimentally tripping the trap with a pencil or other instrument. The sensitivity of the release mechanism should be adjusted so that the trap will release easily if an animal weighing 10 gram (g) or more was to trip it. To adjust the release mechanism, simply push back on the tab holding the "front panel" of the trap to the floor. Traps should be cleaned regularly to insure that no bait or other material becomes lodged under the panel or near the release mechanism, inhibiting the ability of the trap to release.

Sherman traps should be set so that the open end is facing the direction from which an animal is most likely to be travelling. For instance, if a trap is set near an opening within a tree stump, the open end of the trap should be facing the opening in the stump. While they may be set within runways, they are generally not as effective as other means for catching certain grassland species, such as the meadow vole (Microtus pennsylvanicus). However, Sherman traps may be used effectively to catch other species which do not exhibit runway behavior.

Havahart traps

Havahart traps are live traps constructed of steel mesh, and like Sherman traps, are available in a variety of sizes. Size "0" traps (Figure 5, Appendix A) are generally used for mice and voles, while larger sizes are used for rats and other mammals. Havahart traps are not collapsible, and are more difficult to set than Shermans or other box traps. However, if set properly, they may be effective for live trapping some species (e.g. Microtus) that may avoid entering Sherman traps, which are closed on one end. Havahart traps may be placed within well developed runways, provided that they will release effectively in the vegetation where they are set. In such a situation, they need not be baited. Alternatively, they may be baited with rolled oats and placed in the same locations as Sherman or Museum Special traps would be.

Like the Sherman trap, the effectiveness of the release mechanism should always be tested before the trap is set in the field. This should be done after the traps are transported to the site, since in transport the sides of the trap may bend inward, resulting in only partial closure of the trap doors. The speed at which the Havahart trap releases can be adjusted by placing a rubber band along the upper end of the set pin, and extending it to the door latch. This may be done to both doors of the trap.

Havahart traps are set in the following manner. On one side of the trap are located three levers which collectively form the release mechanism; two of these are anchored within the top end of the trap, while the remaining one is anchored near the bottom. One of the top levers is "J" shaped on its free end, the other top lever is straight, and the bottom lever is "L" shaped on one end. All three levers move freely, allowing the trap to be set and to release. To set the trap, the bottom lever must be pushed and held outward so that the "L" shaped end is protruding from the side of the trap as much as possible. While holding both doors of the trap open, the two top release levers are then put in place by resting the "J" shaped end of the the first lever on top of the other top lever. Both levers then are placed so that they rest on top of the "L" shaped end of the bottom lever (Figure 5).

The trap is sprung when an animal steps on a shallow pan at the center of the trap, which causes the bottom lever to move. This frees the two top levers, which were holding up the two trap doors, and the trap doors close.

Tomahawk Traps

Tomahawk traps are also designed for live trapping of animals by using bait (rolled oats and peanut butter). They are constructed of steel mesh, similar to Havahart traps, and are open on only one end (Figure 6, Appendix A). The trap has a single release lever which runs diagonally along one side of the trap, and connects a shallow pan near the center of the trap to a release mechanism in the top front corner of the trap. The trap is set by balancing the lever against the release mechanism. The release mechanism is generally not adjustable. When an animal trips the release, the door falls, capturing the animal. These traps are generally used for larger animals, such as chipmunks (Tamias striatus) or Norway rats (Rattus norvegicus). Trap spacing of Tomahawks should be based upon the area requirements and expected population densities of the target species.

7.3.5 Trap checks

Traps should be checked twice daily in order to minimize damage to dead specimens from cold, heat, or scavengers, and to minimize stress to live animals which in turn could affect histopathology results. Trap checks should be conducted within three hours after dawn, and again within three hours before sunset. When checking traps, each two-person team should carry a small cooler half-filled with wet ice enclosed within ziplocs for specimens, and a five-gallon plastic bucket containing replacement traps for any live traps removed from the field, or any malfunctioning traps. Each person on the trap check team should carry aluminum tags, marking pens and ziploc bags for specimens, and bait for rebaiting any unsuccessful traps. The number of traps damaged or replaced should be noted in field logbooks. One person from each team should be responsible for field documentation of when and under what conditions each trap grid is checked, and how many animals of which species are collected. Teams should maintain radio contact with one another at all times.

When traps are removed from the field, they should be counted per trap line, as each trap line is removed. Once the trap line has been removed and traps counted, they should be placed back into a plastic bucket. A tally should be kept, and the number of traps in the bucket should again be written on a piece of duct tape attached to the bucket handle before leaving the site. Any missing traps should be noted at that time, and replacement traps ordered as soon as possible.

7.3.6 Successful Captures

If a trap is successful and the specimen is dead, the specimen should be labelled immediately with an aluminum tag describing the trap location number, genus and species of the animal, collector's initials, and date. It should then be placed into a ziploc bag, and stored on wet ice in a small cooler for transport to the processing area or laboratory. If an animal is trapped live, then an aluminum tag labelled with the trap number and date should be attached to the trap, and the animal transported to the processing area or laboratory as soon as possible. During summer months, specimens caught in live traps should be temporarily kept in one single location in the shade to avoid overheating and use of fat reserves, until they can be brought to the processing area or lab. This location should be easy to find, or else marked with flagging tape.

Once in the processing area or laboratory, live animals should be killed by cervical dislocation, and the aluminum tag from the trap should be immediately transferred to the animal. Animals should be removed from traps one at a time, so that specimens are not mistagged. A detailed description of processing procedures is given in Draft SOP, Small Mammal Dissection and Tissue Processing.

## 8.0 CALCULATIONS

In comparing areas of different contaminant concentrations, percentage trap success can be a useful means of comparing densities of a given species, provided the data are not confounded with habitat type, or trap technique. Comparisons of body weight between areas and other similar comparisons require knowledge of the age of each specimen collection, so that age is not a confounding factor. Thus good aging techniques are an essential prerequisite for such analyses. Additional calculations pertaining to organ weights, tissue contaminant concentrations and histopathological effects are described in Draft SOP, Small Mammal Dissection and Tissue Processing.

## 9.0 QUALITY ASSURANCE/QUALITY CONTROL

All small mammal specimens shall be documented in accordance with SOP#2002, Sample Documentation, and chain of custody forms filled out according to SOP #4010, Chain of Custody, once samples are shipped. A specimen data sheet must be filled out for each specimen obtained. As described above, specimen tags must be tied to the right hind foot of all specimens. Each tag should contain the trap location number, genus and species, date, and collector's initials.

A bound field logbook must be maintained by field personnel to record daily activities, with entries made in waterproof ink. A separate entry should be made for each trap grid checked, with the total number of animals trapped, species trapped, weather conditions, habitat, etc. recorded. Field activities should be photodocumented as well. The logbook must be maintained in accordance with ERT/REAC SOP #4006, Logbook Documentation.

## 10.0 DATA VALIDATION

All data on field data sheets will be checked against records kept in field logbooks.

## 11.0 HEALTH AND SAFETY

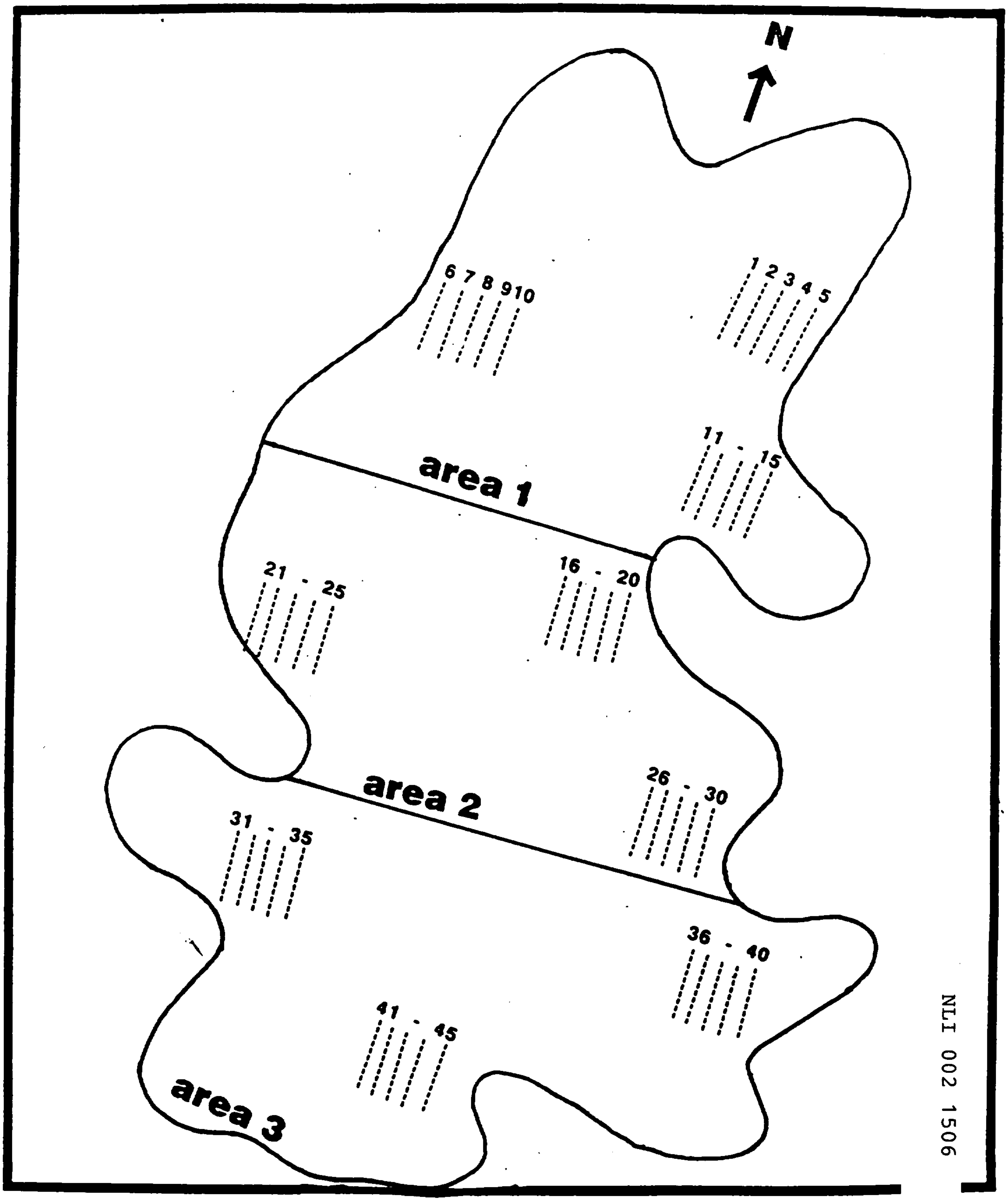
Protective gloves should be worn while trapping, in accordance with the health and safety plan. Care should be taken in handling the traps, in order to avoid injury to the hand. Traps should not be carried while set.

During summer months, small mammals may carry external parasites such as ticks and fleas, which may transmit diseases such as Lyme Disease, Rocky Mountain Spotted Fever or Plague. Unfortunately, insect repellant may not be used, as it may interfere with analytical results. Therefore, personnel should carefully inspect their clothing, and perhaps wear tyvek where appropriate to avoid the possibility of infection by insect bites. In addition, all employees working with live animals should have had both tetanus and rabies vaccinations.

## 12.0 REFERENCES

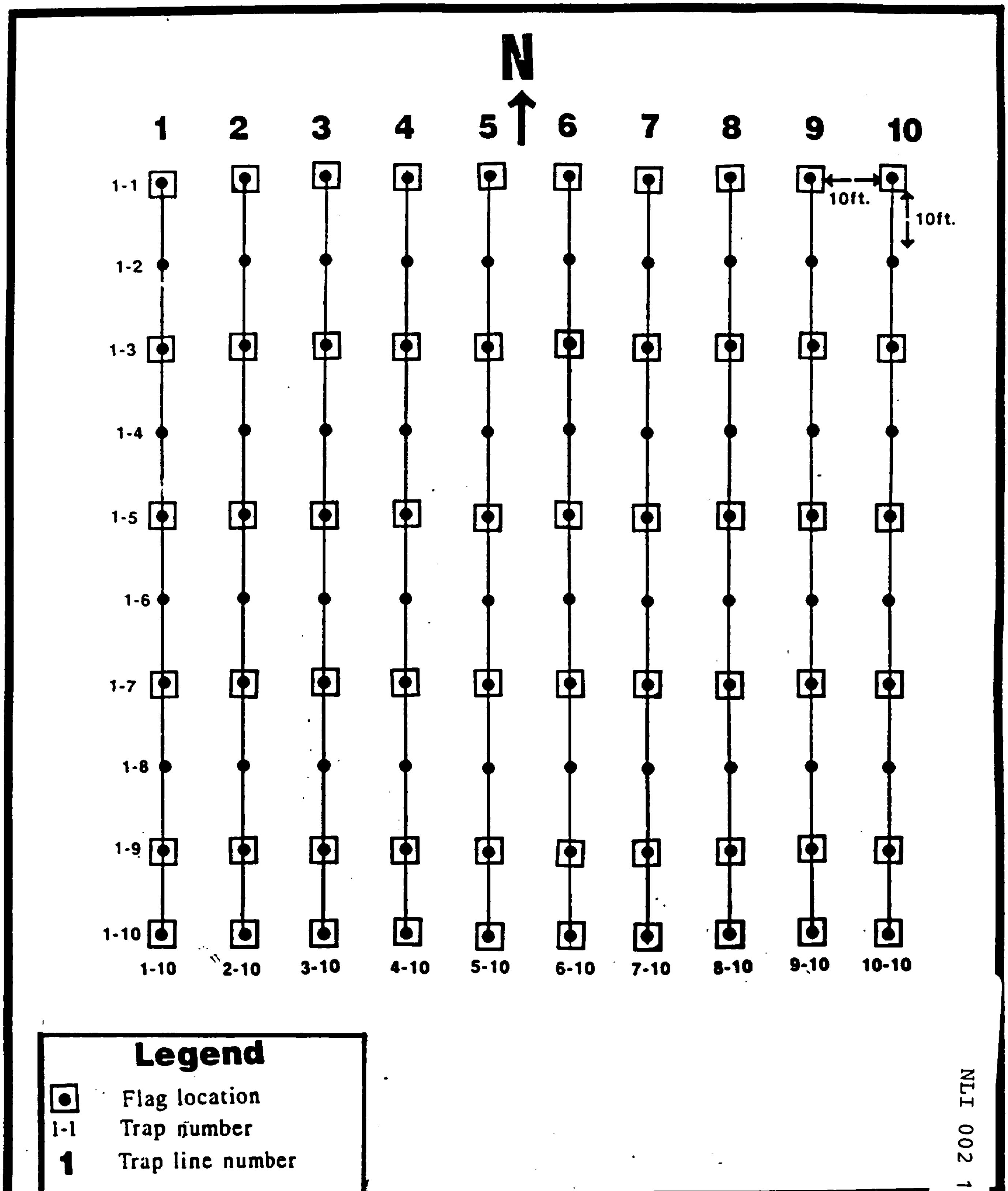
[1]McBee,K. and J.W. Bickham. 1990. Mammals as bioindicators of environmental toxicity, in Current Mammalogy. Plenum Press.

Fig 1 Hypothetical sampling design



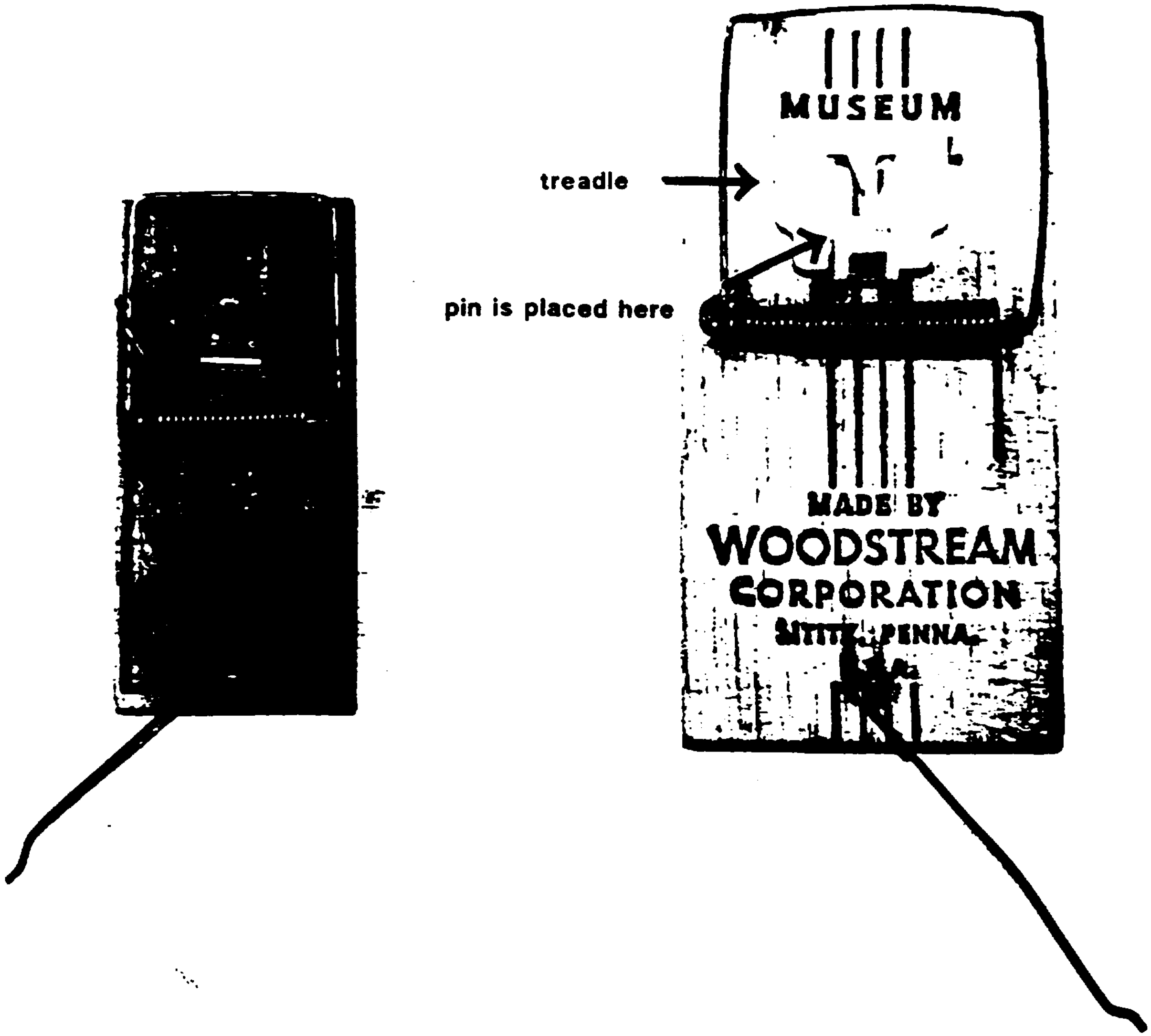

NLI 002 1506

Fig 2 Hypothetical sampling grid



APPENDIX A
FIGURES
SOP #2029
JULY, 1991

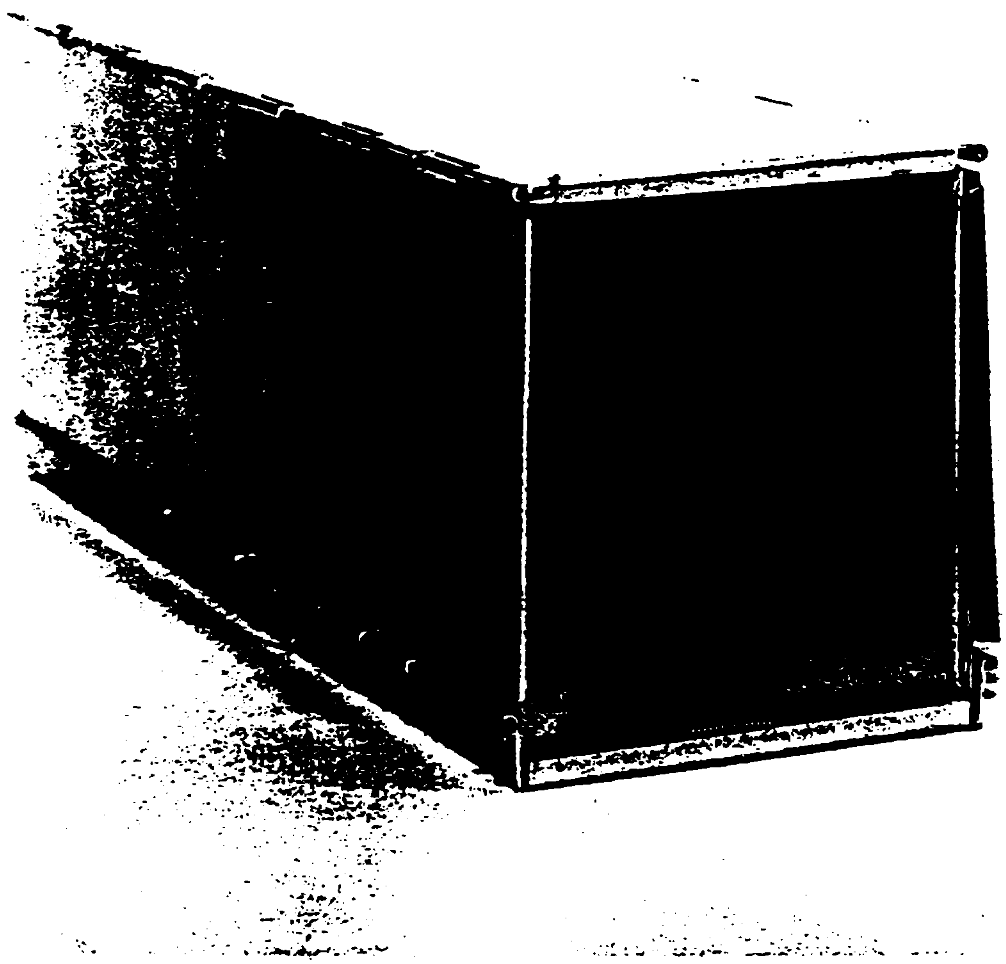
Figure 3. Victor Trap (left) and Museum Special Trap




Scale : 1 inch = 3 inches

NLI 002 1509

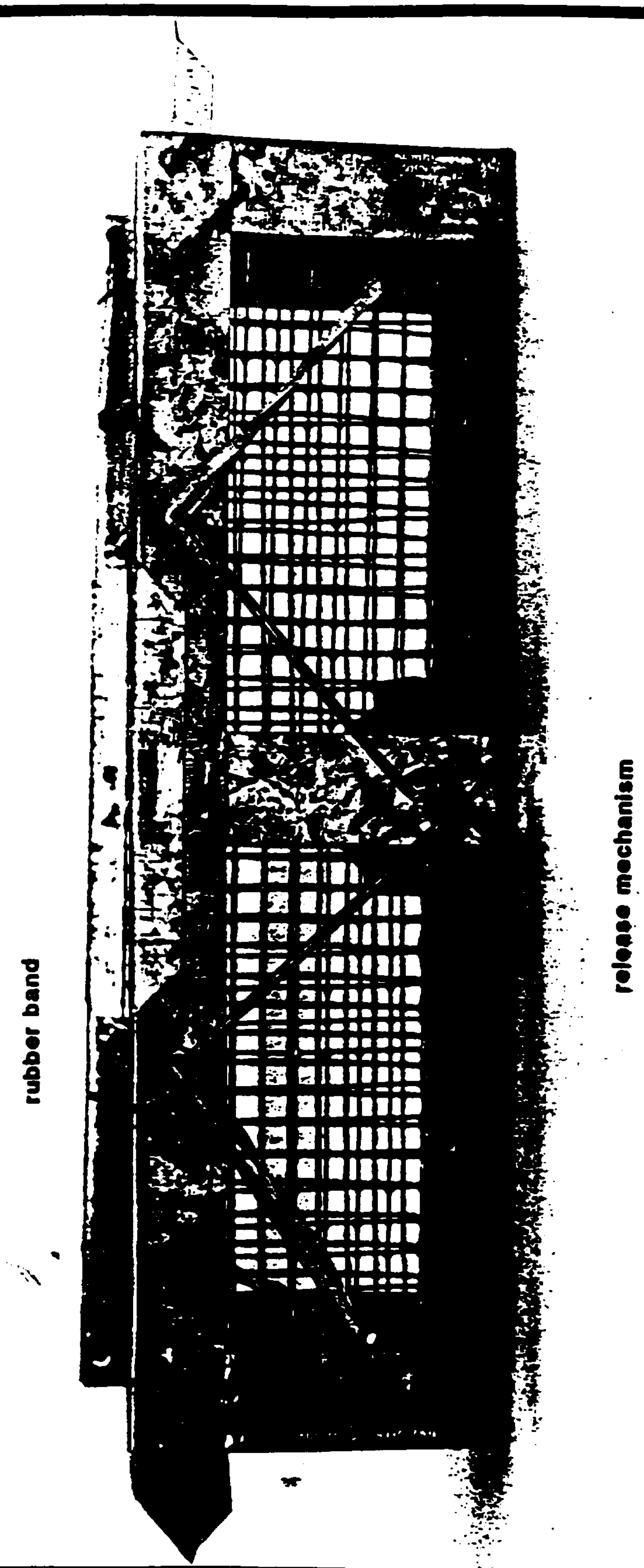
Figure 4. Sherman Box Trap with front door sprung



NLI 002 1510

Scale : 1 inch = 2.5 inches

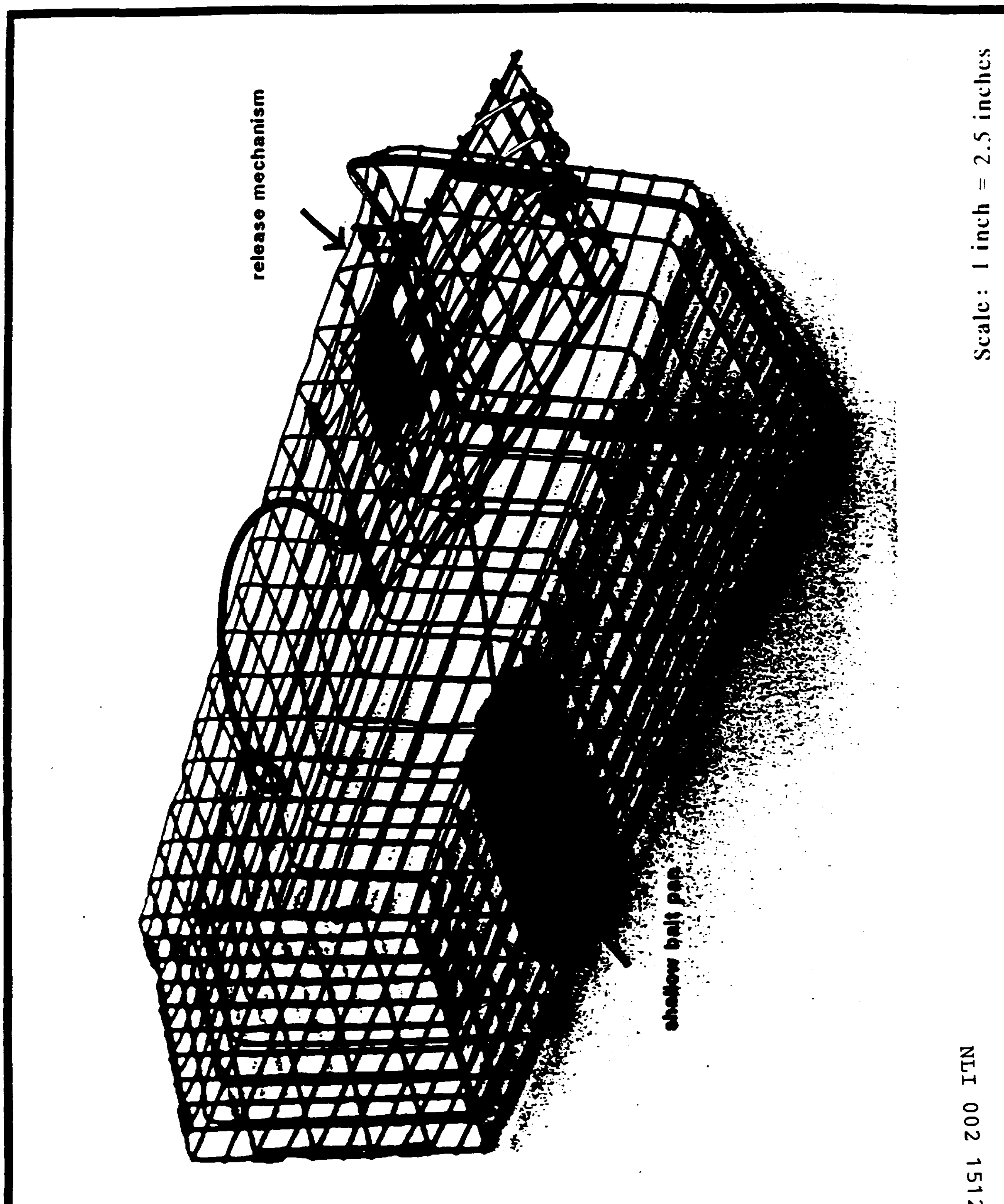
Figure 5. Havahart Trap (size "0") in set position




Scale: 1 inch = 1.25 inches

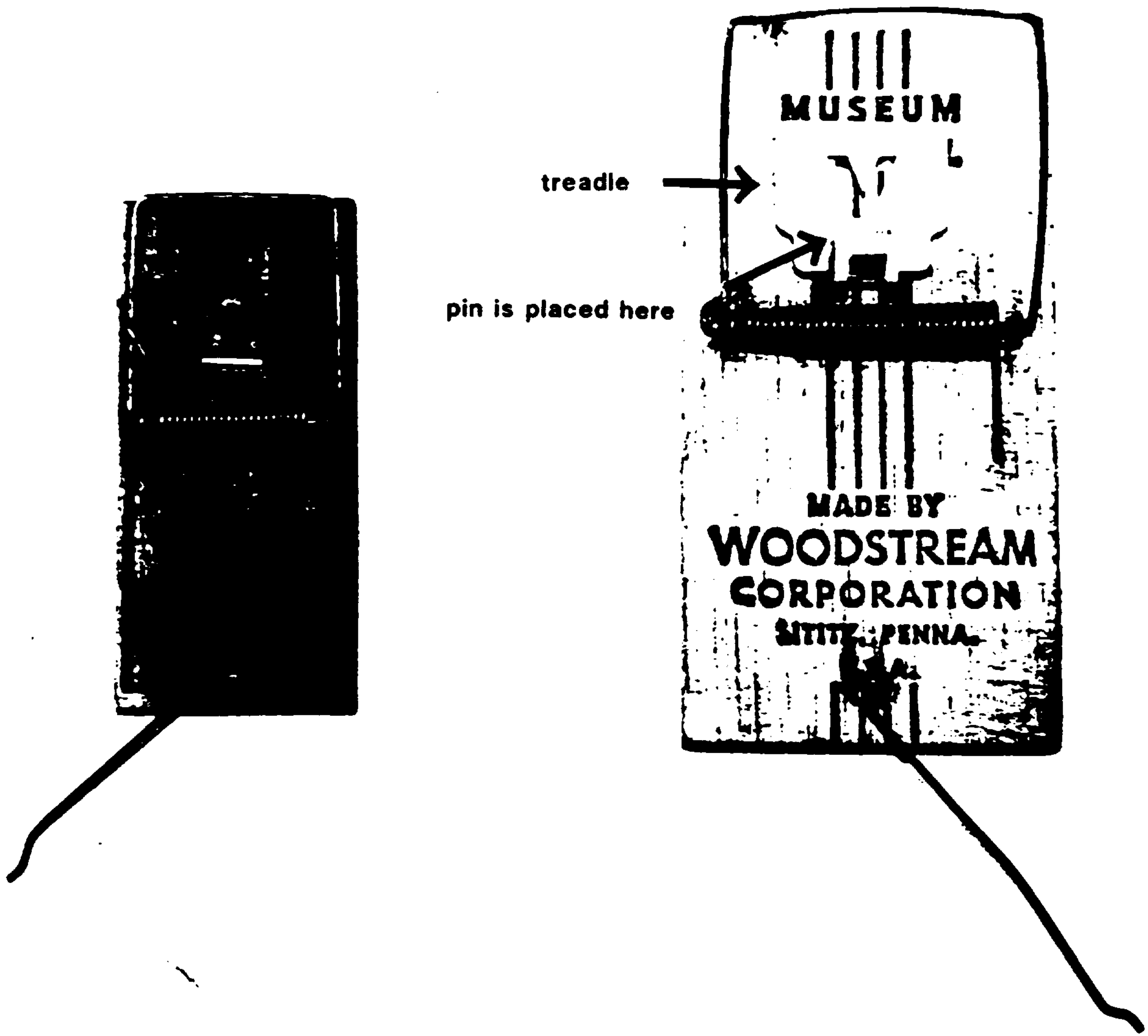
NLI 002 1511

Figure 6. Tomahawk Trap in set position




NLI 002 1512

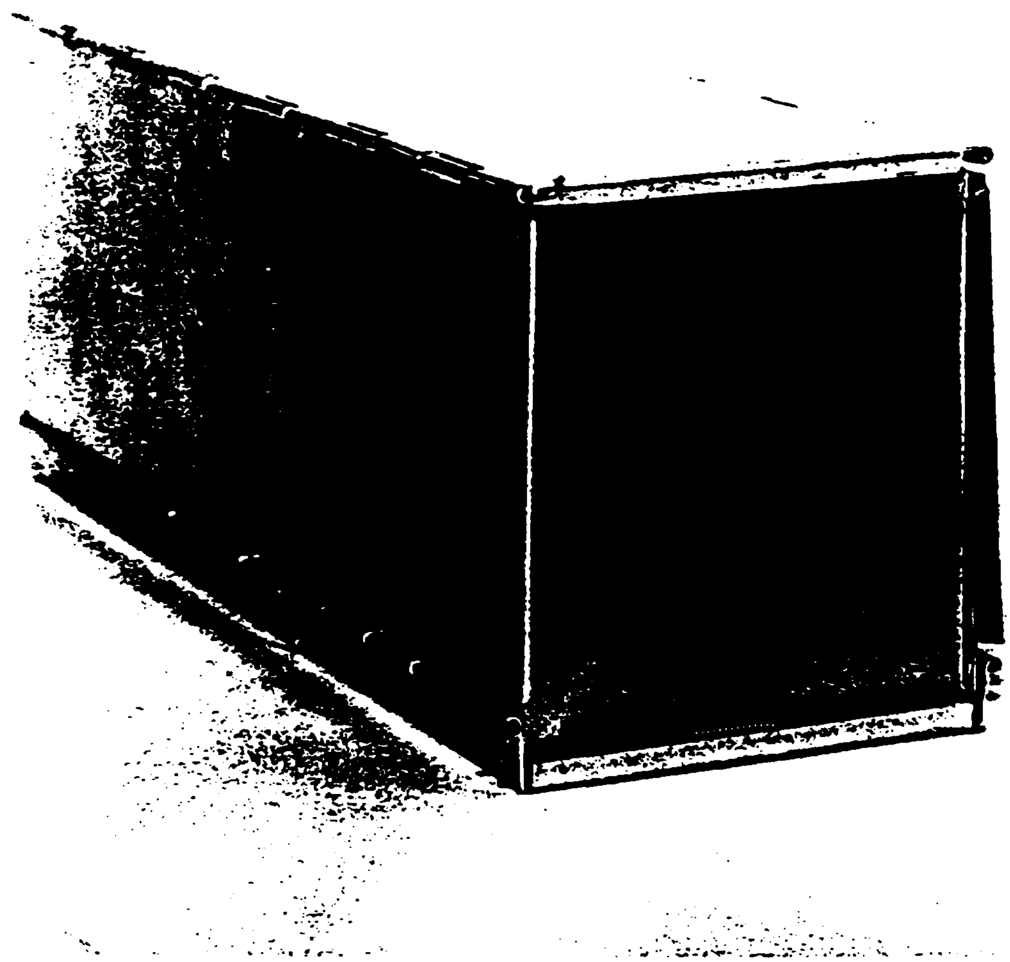
Figure 3. Victor Trap (left) and Museum Special Trap




Scale : 1 inch = 3 inches

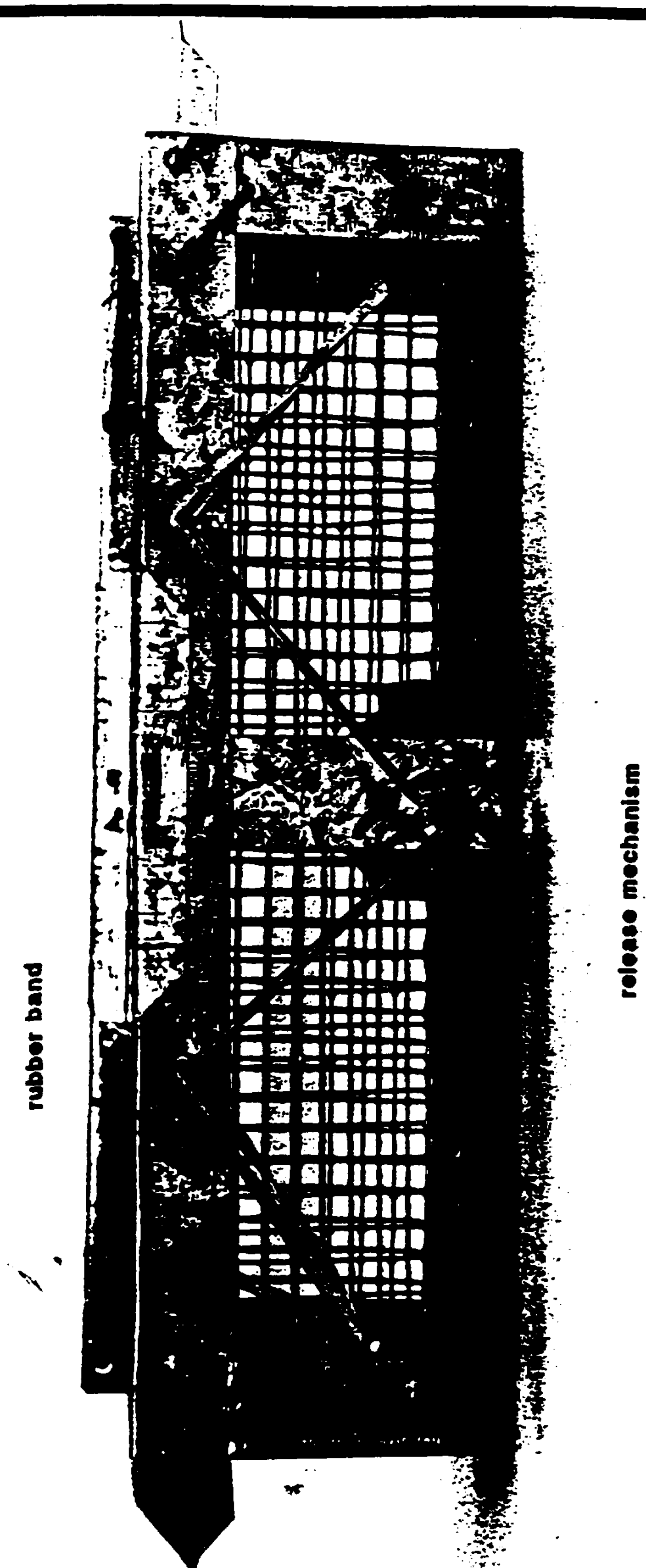
NLI 002 1513

Figure 4. Sherman Box Trap with front door sprung



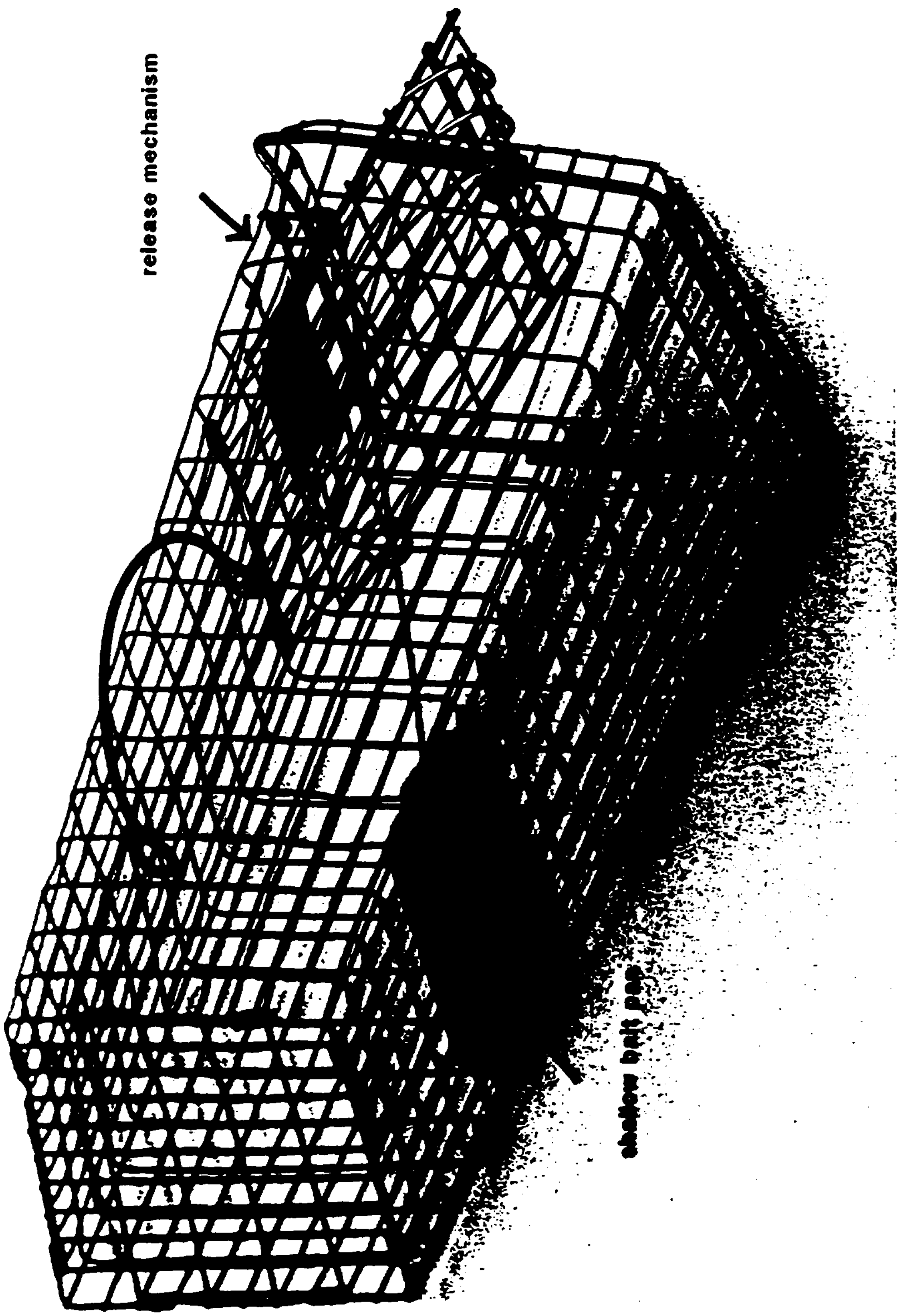
Scale : 1 inch = 2.5 inches

Figure 5. Havahart Trap (size "0") in set position




Scale: 1 inch = 1.25 inches

Figure 6. Tomahawk Trap in set position




Scale: 1 inch = 2.5 inches

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## SMALL MAMMAL PROCESSING AND DISSECTION

### 1.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) describes procedures for the processing and dissection of small mammals collected during bioassessments of Superfund sites. Due to their trophic position as consumers, small mammals can act as indicators of the effects of hazardous contamination on terrestrial and wetland communities[1]. Collected specimens may be used for analysis of (1) contaminant levels in body tissues, (2) histopathological effects of contaminants, (3) effects of contaminants on body condition, growth, and reproduction, and (4) potential impacts on population density and demographics.

### 2.0 METHOD SUMMARY

Small mammal processing will vary with project objectives. However, regardless of objectives, a core set of procedures will be followed in every case. These procedures include verifying the genus and species of each field specimen with published accounts, and recording the age class, sex, and reproductive condition of each specimen, parasites present, and any observed anatomical anomalies. All information will be recorded on specimen data sheets.

Specific project objectives may include contaminant analyses of whole body tissues, histopathology and/or contaminant analysis of selected organ tissues, and in some cases, analysis of anatomical metrics only. Specimens collected for chemical or histopathological analyses will undergo, at the minimum, measurement for standard body metrics and dissection for gross pathology. Specimens collected for whole body contaminant analysis will be frozen whole, unless histopathology is to be performed. In the latter case, sections of specific target tissues will be removed and preserved in 30 milliliter glass vials filled with neutral buffered 10 % formalin. Testes tissue should be initially preserved in Bouin's solution in separate 30 milliliter vials.

Tissue samples will be taken for chemical analyses and sections of the same tissue will be collected for histopathology if both analyses are required. Samples collected for chemical analyses will be frozen, wrapped in aluminum foil, and placed on dry ice within labelled ziploc bags. Tissue sections for histological analyses will be preserved as above. If the study objective is strictly histopathology, then tissue sections of target organs will be taken and preserved as above. If only information on body metrics is required, then specimens will be measured, dissected, internal organs weighed and measured, and then preserved whole in eight-ounce glass jars filled with 4% buffered formaldehyde.

### 3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING AND STORAGE

Following recovery, specimens will be kept in labelled Ziploc bags on wet ice before processing. All specimens should be processed on the same day of collection. Freezing specimens for tissue preservation until processing is completed is only acceptable if histopathological analysis is not going to be conducted. Freezing of tissues causes cell wall disruption and severely complicates accurate histopathological analysis.

Tissues or whole body specimens retained for contaminant analysis will be wrapped in aluminum foil, retained in Ziploc bags and placed on dry ice until analysis. Target tissue sections retained for histopathology will be preserved in glass scintillation vials filled with 4% buffered formaldehyde or Bouin's solution (testes tissue only).

Tissue sections taken for histopathology will be placed in glass scintillation vials filled with 4% paraformaldehyde. The animal number, genus and species, date and processor's initials should be written on a piece of bond paper and placed within the vial. Before shipping to a subcontracting laboratory, each vial should be placed within a labelled Ziploc bag. Typical histopathology procedures should involve preservation of the tissue sections in paraffin blocks and Taking cross-sections at a prescribed dimension (i.e. four microns). Sections would then be mounted on slides and stained with hemotoxylin and eosin (H&E) and the periodic acid Schiff (PAS) reaction techniques. Specific staining techniques requested must be communicated to the subcontract laboratory through the chain of custody and the subcontract. After mounting and staining the tissues, they can then be examined microscopically for evidence of histopathological abnormalities.

## 4.0 INTERFERENCES AND POTENTIAL PROBLEMS

Extreme temperature conditions can alter tissue characteristics of both live and dead animals, making tissue unsuitable for analysis or otherwise influencing tissue characteristics of the specimen. Exposure of dead specimens to extreme cold for extended periods can cause tissue to freeze, making histopathological analysis difficult. Extreme heat can result in rapid decomposition and lysis of tissues. Similarly, live animals may overheat and/or become stressed from capture and retention in traps. This may lead to the utilization of fat reserves and concentration of contaminants, or otherwise influence body physiology. This could bias both chemical and histopathological analyses, or introduce variability into analytical results.

Specimens that cannot be totally processed on the same day they are recovered from the field may be frozen until processing can be completed. This will only be done if histopathological analysis of tissues will not be conducted. Freezing tissues results in cell damage and may introduce artifacts into the histopathological analyses. Therefore, if specimens must be frozen to prevent tissue degeneration and histopathology will be performed on specific tissues then those tissues must be removed prior to freezing.

Specimens may be damaged from predation or decomposition, rendering analyses impossible. Standard body and organ metrics from damaged specimens should not be entered into the database without qualification, since the data may not represent normal conditions.

Statistical comparison of body weights, organ weights, and other metrics between areas of different contamination can be confounded with the age structure of the populations compared. It is important to ensure that comparisons of such parameters are made within age classes. Some species show readily identifiable differences in pelage which enable identification of age class in the field or laboratory. For species whose age determination techniques are not described in the literature, eye lens weight curves and/or metric techniques using sex organs may be developed to ascertain whether individuals captured are adults, subadults or juveniles.

In some cases, the specimen collected may provide insufficient body mass for analysis to a given detection limit. If this occurs, then individuals of the same species from locations within the same area of contamination may be pooled for analysis. Specimens that do not provide sufficient amounts of tissue to conduct analyses of multiple contaminants or groups of contaminants may need to have analyses prioritized in order of decreasing importance. Careful documentation should be made of the order of requested analyses to be conducted on each specimen. This information should be transferred to the analytical laboratory on the chain of custody form in the special instructions section, and in the subcontract. Inconsistencies in organ measurements, age determination, and determination of reproductive condition can arise, unless the processing staff is fully trained and criteria used in collecting the above information are agreed upon in advance. Adhering to the specimen data sheet format should eliminate variability in recording data.

## 5.0 EQUIPMENT/APPARATUS

| | | |
|---|---|---|
| dissecting trays | magnifying lamps | 30 oz. glass vials |
| lab coats | pencil | 8 oz. glass jars |
| surgical gloves | data sheets | Visqueen sheeting |
| data sheets | aluminum foil | 12.7 cm straight blade scissors |
| 15 cm ruler | small scalpel | digital balance (0.001 gm precision) |
| bond paper | dry ice | 15.2 toothed thumb (blunt) forceps |
| ziploc bags | Bouin's solution | 10% buffered paraformaldehyde |
| wet ice | recurved scissors | waterproof marking pens |
| magnifying lamp | rubber aprons | dissecting microscope |

## 6.0 REAGENTS

Specimens, organs, or tissues preserved for histopathological analysis should be preserved in neutral buffered 10% formalin which is equivalent to approximately a 4% buffered formaldehyde solution. Bouin's solution is utilized for the initial preservation of testes. It is comprised of approximately 73% saturated aqueous picric acid, 23% formalin, and 4% glacial acetic acid. These can be bought as stock solutions from any chemical supply company.

## 7.0 PROCEDURES

### 7.1 Initial processing

Specimens trapped in snap or other kill traps should be kept on ice in labelled ziploc bags until processing. Dead specimens should be processed before live specimens since it is likely that tissue degradation has already begun. Specimens should be dissected in order of priority, as determined by analytical requirements. For instance, larger specimens are preferable if chemical analyses are conducted on liver, kidney or other tissues, since method detection limits decrease as sample mass increases. This is particularly true if multiple analyses (e.g. metals, semi-volatiles, PCBs) are to be conducted on the same animal.

In the laboratory or field processing area, live animals should be kept within the traps in which they were caught, and killed by cervical dislocation immediately before processing. This may be accomplished by depressing a surgical probe against the cervical vertebrae at the base of the skull and quickly and forcefully pulling the tail. This technique is quick, humane, and prevents alteration of tissue or other physiological characteristics due to stress associated with suffocation or other measures.

Specimens will be processed one at a time. Each animal will be assigned a unique animal identification number. A specimen data sheet (Appendix A) will be completed for each specimen processed. The trap location, specimen identification number, date, and data on specimen condition as well as all other pertinent information will be recorded on the data sheet. Specimens will initially be washed clean of any extraneous mud and debris using tap water and then paper-toweled dry to avoid biasing the analysis with contaminants lodged in the fur. Specimens will be inspected for external parasites. Specimens will then be measured (total body length, tail length, and hind foot length) to the nearest millimeter and weighed to the nearest 0.001 gram (gm) on an precision electronic analytical balance.

Once the specimen has been weighed and measured, the genus and species of the specimen should be verified. For species with published age criteria based on pelage or other external characteristics, the age class (juvenile, subadult, adult) will be recorded on the data sheet.

External sex characteristics will also be noted. For example, in male mice the distance between the anus and genital opening is greater than in females; in female mice nipples are conspicuous. The scrotum in adult males is also usually evident.

## 7.2 Necropsy and Dissection

Partial necropsies will be performed on all specimens, and gross observations documented. Initially, a check of the carcass for any surficial or orificial abnormalities will be conducted. The dimensions, color, location, physical appearance and number of any abnormalities will be documented on the animal's specimen data sheet. Following documentation, any abnormality will be carefully excised and fixed in 4 % buffered formaldehyde. After fixation, the abnormality will be weighed to the nearest 0.001 gm and submitted for histopathological analyses.

Each specimen will then be dissected according to the procedures outlined in the _Necropsy Guide: Rodents and the Rabbit_ [2]. Briefly, these procedures will be as follows: Cut into the abdominal wall just anterior to the vulva or the penis. Make a shallow incision in order to avoid damage to internal organs. Extend laterally and anteriorly up the center of the abdominal cavity to the rib cage. Fold back the abdominal wall up towards the rib cage fully exposing the abdominal cavity. Examine the abdomen for gross abnormalities.

For all male specimens, remove the testes from the scrotum. Sever each gubernaculum testis (a fibrous connection between the scrotum and the tail of the epididymis). Next, sever each distal end of the vas deferens. Separate the vas deferens and epididymis from each testis. Clean the testes of extraneous tissue using forceps and a scalpel. Record the testes weights to the nearest 0.001 gm. Be sure to note the side on which the testes are located. For example: A 0.043 g testis from the left would be recorded as "L0.043". Also, measure the length and width of each testis to the nearest millimeter. Testes should be preserved in individual scintillation vials filled with Bouin's solution, after a longitudinal incision is made in the right teste, and a lateral incision is made in the left teste. This facilitates tissue fixation and allows laboratories to easily distinguish between right and left testes. The Bouin's solution should be changed within 48-72 hours after initial fixation and replaced with a solution of 70% Ethyl Alcohol.

For all female specimens, cut the pubic symphysis located under the center of the pubis. Dissect the posterior end of the vagina by cutting the skin between the vulva and the anus. Do not cut into the rectum. Gently pull the vagina upward and sever the thin connective tissue between the vagina and the rectum. Cut anteriorly to the cervix. At this point, begin cutting the mesentery supporting the uterine horns up to the ovaries. Gently sever the connective tissue between the ovaries and the kidneys, and lift out the reproductive tract onto a moist paper towel. Separate the uterus and ovaries intact. Make the separation adjacent to the distal side of the cervix from the uterus. Separate and weigh the uterus and ovaries from each side to the nearest 0.001 gm. Also, measure the length and width of the uterus and ovaries to the nearest millimeter. Make note of any abnormalities, uterine scars, corpora lutea, etc. Place each uterus and ovary in a petri dish and immerse in the isotonic saline solution. If embryos are present, note how many are in each uterine horn. Usually the embryos are of similar size and development. If this is not the case, note differences in detail. Take the measurements and weights of one of the embryos which appears to be of approximately average size and mass. Record the embryo crown to rump length and diameter to the nearest millimeter and the weight to the nearest 0.001 gm. Place any removed embryos in the petri dish with the reproductive organs and immerse in the isotonic saline solution.

The next procedure is to remove the spleen. In order to retrieve the spleen, it is necessary to locate the stomach and then cut through the diffuse pancreas and connective tissue that connect the spleen to the stomach. The spleen should lie slightly anterior and dorsal to the stomach. Gently separate the spleen from the stomach connective tissue using forceps and a fine scalpel. Weigh the spleen to the nearest 0.001 gm and then immerse in the isotonic saline solution in the petri dish.

The liver, kidney and adrenal glands are the next organs that should be removed. Carefully grasp the connective tissue under the medial lobe of the liver and sever the esophagus and blood vessels going into the diaphragm. Sever any remaining connective tissue attached to the liver. Remove the liver and weigh to the nearest 0.001 gm and place in a separate petri dish. If histopathology is to be performed then cut two liver tissue sections starting at the distal end of the medial lobe. The sections should be cut 1.0 centimeter towards the center of the lobe, and be approximately 0.5 cm thick. Cut each section using a scalpel and handle carefully. After the sections are taken, place them in 4.0% buffered paraformaldehyde in a 40 ml scintillation vial. Place the remainder of the liver in a separate petri dish and cover to prevent dessication.

Grasp the renal artery and vein of the right kidney with forceps. Sever the vessels with scissors and lift up the kidney while cutting the fatty connective tissue. Clean the kidney of any extraneous fat or connective tissue. The left kidney is to be removed in the same manner. Next, remove the adrenal glands which will be located on the anterior portion of each kidney separated by a thin wall of connective tissue. Weigh each kidney and adrenal gland separately to the nearest 0.001 gm noting their respective sides. If histopathology is to be performed then remove a transverse 0.5 cm cross-section from each kidney through the pelvis. Place these sections in with the preserved liver sections. Retain the remainder of the kidneys and the whole adrenals in a petri dish with the bulk of the liver.

The last organ of collection will be the thymus. In order to gain access to the thymus, the thoracic cavity must be opened. Using a pair of dissecting scissors, cut under the sternum and through the cartilaginous portion of the ribs anteriorly to the neck. Do this on both sides of the sternum. Spread the rib cage apart. Remove the ventral rib cage by making an anterior cut along each of the lateral sides of the rib cage. The thymus is a somewhat translucent, fragile organ located at the base of the trachea, above the heart. Carefully, using fine scissors, remove the thymus by severing the anterior base of the organ. Weigh the thymus to the nearest 0.001 gm and place in the petri dish with the reproductive organs and the spleen.

### 7.3 Final Processing

After all respective organs have been removed, weighed and sectioned they will be preserved according to the study objectives. For whole body analysis, all removed organs except for histopathology sections, will be returned to the central body cavity. The whole body will be wrapped in aluminum foil and frozen on dry ice within a labelled Ziploc bag.

Sections taken for histopathology will be placed in glass scintillation vials filled with 4% paraformaldehyde. The animal number, genus and species, date and processor's initials should be written on a piece of bond paper and placed within the vial. Before shipping to a subcontracting laboratory, each vial should be placed within a labelled Ziploc bag. Typical histopathology procedures should involve preservation of the tissue sections in paraffin blocks and Taking cross-sections at a prescribed dimension (i.e. four microns). Sections would then be mounted on slides and stained with hemotoxylin and eosin (H&E) and the periodic acid Schiff (PAS) reaction techniques. Specific staining techniques requested must be communicated to the subcontract laboratory through the chain of custody and the subcontract. After mounting and staining the tissues, they can then be examined microscopically for evidence of histopathological abnormalities.

If specific organs are targeted for chemical analyses then they will be set aside during dissection procedures. The amount of tissue required will vary with the desired method detection limit for whatever analyses are to be conducted. The amount of tissue sample taken will also depend on the number of analyses conducted. For instance, if the sole objective of the study is to analyze liver tissue for metals contamination, then the entire organ may be removed, wrapped in aluminum foil, and placed in a labelled Ziploc bag on dry ice. However, if whole body analysis for an array of contaminants is to be conducted in addition to a specific analysis on liver tissue, then only the minimum amount of liver tissue required for the specific analysis will be taken. The rest will be replaced into the body cavity of the animal for whole body analysis.

Any portion of the animal not required for chemical analysis will be preserved in eight-ounce glass jars filled with 4% paraformaldehyde or frozen within labelled Ziploc bags, depending on project objectives. An aluminum tag will be tied to the specimen's right hind foot and will contain the following information: site name, animal number, genus and species, date, and processor's initials. Each jar or Ziploc bag will be labelled with the same information.

The storage paraformaldehyde solution will be changed within 10 days and refilled with fresh solution. Boiun's solution preservative for testes tissue will be changed to a solution of 70% ethanol after within 10 days. Waste solution will be disposed of according to SOP#3013, REAC Laboratory Safety.

Before dissecting the next specimen, the processor will ensure that the tools and equipment used to process the specimen have been thoroughly decontaminated. Decontamination of all reusable dissection and processing equipment should involve the following sequence:

Soap and water wash
Water rinse
10% dilute nitric acid rinse
Distilled water rinse
Acetone rinse
Distilled water rinse
Air dry

## ʊ.0 CALCULATIONS

Comparisons of body weight between areas and other similar comparisons require knowledge of the age of each specimen collected, so that age is not a confounding factor. Thus good aging techniques are an essential prerequisite for such analyses.

Organ weights measured as wet weights during dissection are prone to variability due to differences in water content between both organs and specimens. Thus, where possible, analysis for percent moisture of these tissues should be performed in conjunction with any chemical analyses in order to convert organ weights to dry weight. Another source of variation in organ weights may originate from differences in trimming techniques. It is important that all connective and fat tissue be removed from organs before weight measurements are taken.

## 9.0 QUALITY ASSURANCE/QUALITY CONTROL

All small mammal specimens shall be documented in accordance with SOP#2002, Sample

Documentation, and chain of custody forms will be filled out according to SOP #4010, Chain of Custody. The Chain of Custody form will be checked and initialed by the Task Leader or his/her designee before samples are released for analysis. The Task Leader or his/her designee will ensure that the REAC or subcontract laboratory has been fully instructed concerning all chemical analyses, sample numbers and holding times.

A specimen data sheet must be filled out for each specimen obtained. As described above, specimen tags must be tied to the right hind foot of all specimens. Each tag should contain the trap location number, genus and species, date, and collector's initials.

A bound field logbook must be maintained by field personnel to record daily activities, with entries made in waterproof ink. A separate entry should be made for each processing event with notes taken on the total number of animals processed, processing procedures, and number of remaining animals (if any), and how they were stored. The logbook must be maintained in accordance with ERT/REAC SOP #4006, Logbook Documentation.

## 10.0 DATA VALIDATION

All data on specimen data sheets will be checked against records kept in field logbooks.

## 11.0 HEALTH AND SAFETY

Laboratory coats and protective eyeglasses should be worn in the laboratory. A rubber splash apron may be worn while dissecting. Care should be taken in handling small mammals, and leather gloves should be worn in order to avoid injury. During summer months, small mammals may carry external parasites such as ticks and fleas, which may transmit diseases such as Lyme disease, Rocky Mountain spotted fever or plague. Insect repellant may not be used, as it may interfere with analytical results. Therefore, personnel should carefully inspect their clothing, and perhaps wear tyvek where appropriate to avoid the possibility of infection by insect bites. In addition, all employees working with live animals should have had both tetanus and rabies vaccinations.

## 12.0 REFERENCES

(1)McBee, K. and J.W. Bickham. 1990. Mammals as bioindicators of environmental toxicity, *in Current Mammalogy*. Plenum Press.

(2)Feldman, Donald B. and John C. Seeley. 1988. *Necropsy Guide: Rodents and the Rabbit.* CRC Press.

# Appendix E

APPENDIX E
Analytical Results
National Lead Site

/bovitz/fr-4643

ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

National Lead Industries
Pedrickton, NJ

July 13, 1992

EPA Work Assignment No. 3-643
Project No. 3347-31-01-4643
EPA Contract No. 68-03-3482

Submitted to
M. Sprenger
EPA-ERT

| | | |
|---|---|---|
| P. Bovitz<br>Task Leader | Date | Analysis by:<br>Accredited Laboratories |
| V. Kansal<br>S. & A. Section Chief | 7/14/92<br>Date | Prepared by:<br>J. Hunter |
| W. S. Butterfield<br>Project Manager | 7/14/92<br>Date | Reviewed by:<br>M. Barkley |

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Appendix will be furnished on request.

## INTRODUCTION

REAC Laboratory, in response to ERT work assignment 3347-31-01-4643, provided analytical services for samples collected from the National Lead site, located in Pedrickton, NJ, on June 17, 1992. These services involved the sub-contracting of analysis of water samples for Total Organic Carbom (TOC); the performance of QA/QC data validation review; and the production of a report summarizing the analytical results.

Upon receiving the samples in the laboratory the sample custodian followed standard procedures for inspection of the chain-of-custody and record keeping for sample tracking.

| Number of Samples | Matrix | Analysis | Laboratory |
|---|---|---|---|
| 2 | Water | TOC | Accredited Laboratories |

## ANALYTICAL PROCEDURE FOR TOTAL ORGANIC CARBON IN WATER

The subcontractor used USEPA Method 415.1 to analyze the samples. The results of the analyses are listed in Table 1.1.

Table 1.1
Results of the Total Organic Carbon Analysis of Water
National Lead Industries, WA # 3-643

| Sample ID | Location | Concentration (mg/L) | Detection Limit (mg/L) |
|---|---|---|---|
| 16232 | East Stream | 18 | 1.0 |
| 16233 | West Stream | 13 | 1.0 |

# QA/QC FOR TOTAL ORGANIC CARBON

## Results of Matrix Spike/Matrix Spike Duplicate Analysis

Sample 16232 was chosen for the matrix spike/matrix spike duplicate analysis. The percent recoveries for the matrix spike/matrix spike duplicate analysis, listed in Table 2.1, were 98 and 100. The relative percent difference (RPD), also listed in Table 2.1 was 2.

Table 2.1
Results of the Matrix Spike/Matrix Spike Duplicate Analysis
National Lead, WA # 3-643

Sample ID: 9203225 *

| Conc. Sample (mg/L) | Conc. Spiked (mg/L) | Matrix Spike Conc. (mg/L) | Matrix Spike % Recovery | Matrix Spike Duplicate Conc. (mg/L) | Matrix Spike Duplicate % Recovery | RPD |
|---|---|---|---|---|---|---|
| 5 | 100 | 103 | 98 | 105 | 100 | 2 |

RPD denotes relative percent difference
* denotes that a non-ERT/REAC sample was used by the sub-contracting laboratory

WESTON
MANAGERS DESIGNERS/CONSULTANTS

REAC SUPPORT ORGANIZATION
GSA RARITAN DEPOT
2890 WOODBRIDGE AVENUE
BLDG. 209 ANNEX
EDISON, NJ 08837-3679
908-632-9200 • FAX: 908-632-9205

DATE: July 13, 1992

TO: R. Singhvi EPA/ERT

FROM: V. Kansal S&A Section Chief VCK

SUBJECT: DOCUMENT TRANSMITTAL UNDER WORK ASSIGNMENT # 3-643

Attached please find the following document prepared under this work assignment:

National Lead - Analytical Report Summarizing TOC analysis of Water Samples

Central File WA# 3-643 (w/attachment)
W.S. Butterfield
M. Sprenger
P. Bovitz
M. Barkley

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

## CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 58

SHEET NO. 1

Project Name: National Lead
Project Number: 3347-31-01-4643
RFW Contact: P. Boutz    Phone: 908-632-9200

SAMPLE IDENTIFICATION    ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | TOC | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 16232 | East Stream | W | 6/17/92 | 1 | 8oz Amber/HCl pH<2 | X | | | 9204214 |
| | 16233 | West Stream | W | 6/17/92 | 1 | 8oz Amber/H2SO4 pH<2 | X | | | 9204215 |

preliminary results due 6/22
written results due 7/7
Tier 1

90000

Matrix:
SD - Sediment    PW - Potable Water    S - Soil
DS - Drum Solids    GW - Groundwater    W - Water
DL - Drum Liquids    SW - Surface Water    O - Oil
X - Other    SL - Sludge    A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/Analysis | W. VanDoren | 6/18/92 | | | | | Courier | 6/19 | L. Senko | 6/19 | 10:00 |

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ANALYSIS PARAMETERS

Project # 3347-31-01-4643, National Lead

| Analysis/Method | Matrix | # of samples | Unit Cost | Total |
|---|---|---|---|---|
| Total Organic Carbon/EPA415.1 | Soil/Sediment | 20/5 | | |
| Grain Size/ASTM D422 | Soil/Sediment | 20/5 | | |
| Data package including diskette deliverables* as per CLP or attached Deliverables Requirements | | | | |

20 samples are expected to arrive at your laboratory on June 19, 1992 and an additional 5 samples will arrive on July 17, 1992. All applicable QA/QC analysis will be performed on our sample matrix. The preliminary data packages including a signed copy of our Chain of Custody are due at REAC on July 6, 1992 and July 31, 1992 respectively with the complete data packages by July 17, 1992 and August 7, 1992. If your laboratory cannot meet the delivery dates, please give best delivery date possible.

*Diskette deliverables are required in either CLP format, or tabulated results in Lotus 1-2-3 spreadsheet. Please submit either a 3.5" or 5.25" diskette with the data package.

Diskette deliverables will be provided, in CLP format__________/in Lotus 1-2-3 tables_________.

Data Package Scheduled Delivery Date:_______________

P. Bovitz — Date 6/11/92

Misty Barkley — Date 6/11/92.

4643Mat

ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

National Lead
Pedricktown, NJ

August 14, 1992

EPA Work Assignment No. 3-643
Weston Work Order No. 3347-31-01-4643
EPA Contract No. 68-03-3482

Submitted to
M. Sprenger
EPA-ERT

for PB 8/12/92
P. Bovitz — Date
Task Leader

Vinod Kansal 8/12/92
V. Kansal — Date
S. & A. Section Chief

8/13/92
W. S. Butterfield — Date
Project Manager

Analysis by:
Accredited Labs, Inc.
REAC

Prepared by:
G. Karustis

Reviewed by:
M. Barkley

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Appendices will be furnished on request

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# INTRODUCTION

REAC Laboratory, in response to ERT Work Assignment # 3-643, provided analytical services for soil samples collected from the National Lead Site in Pedricktown, NJ on June 24, 25, and 26, 1992 and received by the laboratory on June 26, and June 29, 1992. These services involved the subcontracted analysis of soil samples for grain size and total organic carbon, the analyses of soil and sediment samples for lead, QA/QC data review, and a report summarizing the analytical procedures, results and QA/QC.

The samples are summarized in the following table:

| Number of Samples | Matrix | Analysis Requested | Laboratory |
|---|---|---|---|
| 20 | Soil | Grain Size | Accredited Laboratories, Inc. |
| 20 | Soil | Total Organic Carbon | Accredited Laboratories, Inc. |
| 20 | Soil | Lead | REAC |

## ANALYTICAL PROCEDURE FOR LEAD

One gram of sample, weighed to 0.01 g accuracy, was thoroughly mixed with 10 ml 1:1 nitric acid:water, and digested according to method #3050 contained in Test Methods for Evaluating Solid Wastes, USEPA, SW-846, September, 1987.

Results of the analyses are listed in Table 1.1.

## ANALYTICAL PROCEDURE FOR GRAIN SIZE

The subcontract laboratory determined the grain size distribution using ASTM Method D422. The results are listed in Table 1.2.

## ANALYTICAL PROCEDURE FOR TOTAL ORGANIC CARBON

The subcontract laboratory determined the total organic carbon content of the samples using USEPA Method 415.1. The results are listed in Table 1.3.

Table 1.1
Results of the Lead Analysis
WA # 3-643 NATIONAL LEAD
(based on dry weight)

| | | Parameter: | LEAD | MDL |
|---|---|---|---|---|
| | | Unit: | mg/kg | mg/kg |
| Client # | Location: | | | |
| A 15833 | 1 | | 290 | 29 |
| A 15834 | 2 | | 190 | 11 |
| A 15835 | 3 | | 810 | 29 |
| A 15836 | 4 | | 180 | 11 |
| A 15838 | 5 | | 1100 | 59 |
| A 15840 | 6 | | 720 | 29 |
| A 15841 | 7 | | 450 | 29 |
| A 15842 | 8 | | 1800 | 59 |
| A 15843 | 9 | | 3500 | 120 |
| A 15844 | 10 | | 830 | 59 |
| A 15845 | 11 | | 1300 | 59 |
| A 15846 | 12 | | 1600 | 118 |
| A 15847 | 13 | | 1500 | 118 |
| A 15848 | 14 | | 2200 | 306 |
| A 15849 | 15 | | 1800 | 304 |
| A 15850 | 16 | | 6700 | 583 |
| A 15851 | 17 | | 6800 | 581 |
| A 15852 | 18 | | 6900 | 570 |
| A 15853 | 19 | | 2600 | 111 |
| A 15854 | 20 | | 120 | 6 |

MDL denotes Method Detection Limit

Table 1.2 Results of the Grain Size Analysis
WA # 3-643 National Lead

| Sample ID<br>Location | C15833<br>#1 | C15834<br>2 | C15835<br>3 | C15836<br>4 | C15838<br>5 | C15840<br>6 | C15841<br>7 | C15842<br>8 | C15843<br>9 | C15844<br>10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sieve Size (mesh)** | **% Retained** | **% Retained** | **% Retained** | **% Retained** | **% Retained** | **% Retained** | **% Retained** | **% Retained** | **% Retained** | **% Retained** |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.13 | 2.35 | 0.52 | 2.91 |
| 10 | 2.59 | 0.13 | 4.14 | 1.51 | 3.36 | 2.78 | 2.11 | 35.24 | 19.52 | 35.99 |
| 30 | 11.44 | 9.78 | 14.13 | 15.16 | 15.92 | 17.78 | 13.73 | 49.02 | 46.24 | 28.33 |
| 50 | 39.94 | 37.34 | 30.51 | 36.54 | 32.61 | 35.61 | 38.96 | 9.80 | 20.04 | 18.07 |
| 100 | 25.33 | 31.12 | 24.66 | 24.31 | 24.02 | 22.98 | 26.74 | 1.73 | 8.04 | 10.26 |
| 200 | 10.98 | 11.55 | 14.67 | 13.48 | 16.04 | 12.47 | 11.92 | 0.92 | 2.82 | 3.06 |
| Pass 200 | 9.72 | 10.08 | 11.88 | 9.01 | 8.05 | 8.13 | 6.40 | 0.92 | 2.82 | 1.38 |

| Diameter (mm) | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.678 | | | | | | 25.00 | | | | |
| 0.664 | | | | | | | 35.00 | | | |
| 0.663 | 35.00 | | | | 35.00 | | | | | |
| 0.647 | | | | 50.00 | | | | | | |
| 0.596 | | | 30.48 | | | | | | | |
| 0.558 | | 28.10 | | | | | | | | |
| 0.469 | | | | | | | | | | |
| 0.456 | | | | | | | | | 51.41 | |
| 0.452 | | | | | | | | | | 36.67 |
| 0.446 | | | | | | | | 36.61 | | |
| 0.252 | | | | | | | 15.00 | | | |
| 0.251 | 15.00 | | | | 15.00 | | | | | |
| 0.249 | | | | 20.00 | | 20.00 | | | | |
| 0.223 | | | 17.42 | | | | | | | |
| 0.211 | | 12.04 | | | | | | | | |
| 0.176 | | | | | | | | | | |
| 0.174 | | | | | | | | 22.88 | | |
| 0.173 | | | | | | | | | 30.85 | 20.00 |
| 0.126 | | | | | 15.00 | 15.00 | 15.00 | | | |
| 0.125 | 15.00 | | | | | | | | | |
| 0.124 | | | | 20.00 | | | | | | |
| 0.113 | | | 13.06 | | | | | | | |
| 0.105 | | 12.04 | | | | | | | | |
| 0.088 | | | | | | | | 18.31 | | 13.34 |
| 0.087 | | | | | | | | | 25.71 | |
| 0.026 | | | | 15.00 | 15.00 | 15.00 | 15.00 | | | |
| 0.025 | 15.00 | | | | | | | | | |
| 0.023 | | | 13.06 | | | | | | | |
| 0.021 | | 12.04 | | | | | | | | |
| 0.018 | | | | | | | | 18.31 | 20.57 | 10.00 |

Table 1.2 (Cont) Results of the Grain Size Analysis
WA # 3-643 National Lead

| Sample ID | C15845 | C15846 | C15847 | C15848 | C15849 | C15850 | C15851 | C15852 | C15853 | C15854 |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Sieve Size (mesh) | % Retained | % Retained | % Retained | % Retained | % Retained | % Retained | % Retained | % Retained | % Retained | % Retained |
| 4 | 0.37 | 0.21 | 0.31 | 0.89 | 0.50 | 0.00 | 8.71 | 0.00 | 3.04 | 5.83 |
| 10 | 5.55 | 1.91 | 1.55 | 4.99 | 2.34 | 20.26 | 38.30 | 17.36 | 32.25 | 29.56 |
| 30 | 19.92 | 26.53 | 25.67 | 34.22 | 34.84 | 27.91 | 36.28 | 51.90 | 35.72 | 44.21 |
| 50 | 28.75 | 32.82 | 31.28 | 26.77 | 27.80 | 1[illegible].81 | 6.44 | 14.67 | 9.74 | 7.58 |
| 100 | 23.16 | 23.09 | 22.65 | 14.26 | 15.75 | 11.80 | 2.14 | 3.99 | 3.96 | 1.66 |
| 200 | 15.89 | 10.15 | 11.61 | 9.45 | 9.71 | 5.96 | 2.38 | 3.39 | 4.26 | 2.83 |
| Pass 200 | 6.35 | 5.29 | 6.93 | 9.45 | 9.04 | 16.26 | 5.73 | 8.68 | 11.01 | 8.33 |

| Diameter (mm) | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing | % Passing |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.479 | | | | 72.99 | | | | | | |
| 0.474 | | 20.00 | 20.00 | | 92.31 | | 27.84 | | | |
| 0.469 | 23.34 | | | | | | | | | |
| 0.466 | | | | | | 26.67 | | 27.49 | 26.67 | |
| 0.458 | | | | | | | | | | 33.33 |
| 0.176 | 13.34 | | | 58.39 | 61.54 | | | | | |
| 0.175 | | 16.67 | 16.67 | | | | | | | |
| 0.174 | | | | | | | 23.20 | | 16.67 | |
| 0.173 | | | | | | 20.00 | | 20.62 | | |
| 0.171 | | | | | | | | | | 23.33 |
| 0.089 | | | | | | | | 10.31 | 10.00 | |
| 0.088 | 13.34 | 13.34 | 13.34 | 43.80 | 46.15 | 13.33 | 18.56 | | | 13.33 |
| 0.018 | 10.00 | 10.00 | 10.00 | 43.80 | 46.15 | 10.00 | 13.92 | 10.31 | 10.00 | 10.00 |

Table 1.3 Results of the Total Organic Carbon Analysis
WA 3-463 National Lead
(based on dry weight)

| Sample ID | Location | Concentration (g/kg) | Method Detection Limit (g/kg) |
|---|---|---|---|
| Method Blank | | ND | 1.0 |
| B 15833 | #1 | 26 | 6.0 |
| B 15834 | 2 | 13 | 2.2 |
| B 15835 | 3 | 64 | 12.7 |
| B 15836 | 4 | 17 | 2.3 |
| B 15838 | 5 | 68 | 12.8 |
| B 15840 | 6 | 55 | 12.5 |
| B 15841 | 7 | 31 | 6.1 |
| B 15842 | 8 | 180 | 30.0 |
| B 15843 | 9 | 140 | 22.3 |
| B 15844 | 10 | 120 | 20.5 |
| B 15845 | 11 | 99 | 14.8 |
| B 15846 | 12 | 90 | 14.5 |
| B 15847 | 13 | 120 | 16.7 |
| B 15848 | 14 | 200 | 27.9 |
| B 15849 | 15 | 190 | 29.2 |
| B 15850 | 16 | 41 | 7.1 |
| B 15851 | 17 | 170 | 33.9 |
| B 15852 | 18 | 190 | 30.9 |
| B 15853 | 19 | 130 | 24.3 |
| B 15854 | 20 | 210 | 29.4 |

## QA/QC FOR LEAD

### Results of the EMSL Analysis

EMSL WP 988 #19 was used to check the accuracy of the calibration curve. The percent recovery was 105. The 95% confidence limit for EMSL WP 988 #19 is not available. The recovery is listed in Table 2.1.

### Results of the Matrix Spike/Matrix Spike Duplicate Analysis

Samples A 15833 and A 15848 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.2, were 113 and 123. The relative percent difference (RPD), also listed in Table 2.2 was 9. Two percent recoveries were not calculated because the concentration of lead in the sample was more than twice that in the spike.

### Results of the Spike Blank Analysis

The results of the spike blank analysis are reported in Table 2.3. The percent recoveries were both 108.

Table 2.1
Results of the EMSL Analysis
WA # 3-643 NATIONAL LEAD

| METAL | EMSL # | CONC. RECOVERED ug/l | TRUE VALUE ug/l | 95 % CONFIDENCE INTERVAL | % RECOVERY |
|---|---|---|---|---|---|
| Lead | WP 988 #19 | 1048 | 1000 | NA | 105 |

NA denotes Not Available

Table 2.2
Results of the MS/MSD Analyses
WA # 3-643 NATIONAL LEAD

| METAL | SAMPLE ID | SAMPLE CONC. ug/kg | ORIGINAL CONC. Spike ug/kg | ORIGINAL CONC. Dup. ug/kg | RECOVERED CONC. Spike ug/kg | RECOVERED CONC. Dup. ug/kg | % RECOVERY Spike | % RECOVERY Dup. | RPD |
|---|---|---|---|---|---|---|---|---|---|
| Lead | A 15833 | 292991 | 90318 | 90318 | 394599 | 404082 | 113 | 123 | 9 |
| Lead | A 15848 | 2202799 | 90555 | 91917 | NC | NC | NC | NC | NC |

RPD denotes Relative Percent Difference
NC denotes Not Calculated because the concentration of lead in the sample is more than twice that of the spike

Table 2.3
Results of the Blank Spike Analysis
WA # 3-643 NATIONAL LEAD

| METAL | TEST | Blank Spike Concentration ug/kg | Spike Blank Recovered Conc. ug/l | % Spike Recovery |
|---|---|---|---|---|
| Lead | 1 | 100000 | 108000 | 108 |
| Lead | 2 | 100000 | 108300 | 108 |

QA/QC FOR TOTAL ORGANIC CARBON

Results of the Matrix Spike/Matrix Spike Duplicate Analysis

Sample A 15833 was chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.4, were 85 and 135. The relative percent difference (RPD), also listed in Table 2.4 was 45.

Table 2.4 Results of the MS/MSD Analysis
WA 3-463 National Lead

Sample ID B 15833

| Sample Conc mg/l | Spike Added mg/l | MS Conc mg/l | MSD Conc mg/l | MS Percent Recovery | MSD Percent Recovery | RPD |
|---|---|---|---|---|---|---|
| 215 | 100 | 300 | 350 | 85 | 135 | 45 |

RPD denotes Relative Percent Difference

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

## CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 59_8

SHEET NO. 2 OF

Project Name: NATIONAL LEAD
Project Number: 3347-31-01-4643
RFW Contact: PAUL BOULTZ Phone: 632-9200

| SAMPLE IDENTIFICATION | | | | | | | ANALYSES REQUESTED | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | TOC | | | |
| | B15833 | #1 | S | 6/24/92 | 1 | 4°C | | | 9204397 | |
| | B15834 | 2 | | | | | | | 9204398 | |
| | B15835 | 3 | | | | | | | 9204399 | |
| | B15836 | 4 | | | | | | | 400 | |
| | B15838 | 5 | | | | | | | 401 | |
| | B15840 | 6 | | | | | | | 9204402 | |
| | B15841 | 7 | | | | | | | 9204403 | |
| | B15842 | 8 | | | | | | | 9204404 | |
| | B15843 | 9 | | | | | | | 9204405 | |
| | B15844 | 10 | | 6/25/92 | | | | | 9204406 | |
| | B15845 | 11 | | | | | | | 9204407 | |
| | B15846 | 12 | | | | | | | 9204408 | |
| | B15847 | 13 | | | | | | | 9204409 | |
| | B15848 | 14 | | | | | | | 9204410 | |
| | B15849 | 15 | | | | | | | 9204411 | |
| | B15850 | 16 | | | | | | | 9204412 | |
| | B15851 | 17 | | | | | | | 9204413 | |
| | B15852 | 18 | | | | | | | 9204414 | |
| | B15853 | 19 | | | | | | | 9204415 | |
| | B15854 | 20 | | 6/26/92 | | | | | 9204416 | |

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | J. Regon | 6/26 | 3:00 | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

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NLI 002 1552

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

## CHAIN OF CUSTOD' ,ECORD/LAB WORK REQUEST

No: 59.9

Project Name: NATIONAL LEAD
Project Number: 3347-31-01-4643
RFW Contact: PAUL BOVITZ Phone: 632-9200

SHEET NO. 1 OF

SAMPLE IDENTIFICATION (MC) — ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | GRAIN SIZE | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | C15833 | #1 | S | 6-25-92 | 1 | 4°C | | 9204377 | | |
| | C15834 | 2 | | | | | | 9204378 | | |
| | C15835 | 3 | | | | | | 9204379 | | |
| | C15836 | 4 | | | | | | 9204380 | | |
| | C15838 | 5 | | | | | | 9204381 | | |
| | C15840 | 6 | | | | | | 4382 | | |
| | C15841 | 7 | | | | | | 9204383 | | |
| | C15842 | 8 | | | | | | 9204384 | | |
| | C15843 | 9 | | | | | | 9204385 | | |
| 1 | C15844 | 10 | | 6/25/92 | | | | 9204386 | | |
| | C15845 | 11 | | | | | | 9204387 | | |
| | C15846 | 12 | | | | | | 9204388 | | |
| | C15847 | 13 | | | | | | 9204389 | | |
| | C15848 | 14 | | | | | | 390 | | |
| | C15849 | 15 | | | | | | 9204391 | | |
| | C15850 | 16 | | | | | | 9204392 | | |
| | C15851 | 17 | | | | | | 9204393 | | |
| | C15852 | 18 | | | | | | 9204394 | | |
| | C15853 | 19 | | | | | | 9204395 | | |
| | C15854 | 20 | | 6-26-92 | | | | 9204396 | | |

00014 F76 052

**Matrix:**
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All analyses | [illegible] | 6-26-92 | [illegible] | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

NLI 002 1553

**Roy F. Weston, Inc.**
REAC, Edison, N.J.
EPA Contract 68-03-3482

# CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 59

SHEET NO. 1 OF

Project Name: NATIONAL LEAD
Project Number: 3347 - 31 - 01 - 4643
RFW Contact: PAUL BENITZ Phone: 908 632-9200

**SAMPLE IDENTIFICATION** / **ANALYSES REQUESTED**

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | LEAD | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A 15833 | #1 | S | 6/24/92 | 1 | 8oz glass/4°C | | | | |
| | A 15834 | 2 | | | | | | | | |
| | A 15835 | 3 | | | | | | | | |
| | A 15836 | 4 | | | | | | | | |
| | A 15838 | 5 | | | | | | | | |
| | A 15840 | 6 | | | | | | | | |
| | A 15841 | 7 | | | | | | | | |
| | A 15842 | 8 | | | | | | | | |
| | A 15843 | 9 | | | | | | | | |
| | A 15844 | 10 | | 6/25/92 | | | | | | |
| | A 15845 | 11 | | | | | | | | |
| 1 | A 15846 | 12 | | | | | | | | |
| | A 15847 | 13 | | | | | | | | |
| | A 15848 | 14 | | | | | | | | |
| | A 15849 | 15 | | | | | | | | |
| | A 15850 | 16 | | | | | | | | |
| | A 15851 | 17 | | | | | | | | |
| | A 15852 | 18 | | | | | | | | |
| | A 15853 | 19 | | | | | | | | |
| | A 15854 | 20 | | 6/26/92 | | | | | | |

**Matrix:**

| | | | | | |
|---|---|---|---|---|---|
| SD - | Sediment | PW - | Potable Water | S - | Soil |
| DS - | Drum Solids | GW - | Groundwater | W - | Water |
| DL - | Drum Liquids | SW - | Surface Water | O - | Oil |
| X - | Other | SL - | Sludge | A - | Air |

Special Instructions:

**FOR SUBCONTRACTING USE ONLY**
**FROM CHAIN OF CUSTODY #**

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All/Analysis | John Johnson | 6/24/92 | Pradeep Gupta | 6/25/92 | 2:30 | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

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NLI 002 1554

ROY F. WESTON, INC./REAC
GSA RARITAN DEPOT
2890 WOODBRIDGE AVENUE
BLDG. 209 ANNEX
EDISON, NJ 08837-3679
908-632-9200 • FAX: 908-632-9205

June 18,1992

Accredited.
Foot of Pershing Ave
P.O. Box 369
Carteret, NJ 07008-0369

Attn: Regina Metcalf/Mark Petegrew
Re: Project # 3347-31-01-4643, National Lead

As per Weston REAC Purchase Order number 08-81942, dated 06/18/92,please analyze samples according to the following parameters:

| Analysis/Method | Matrix | # of samples | Unit Cost | Total |
|---|---|---|---|---|
| Total Organic Carbon/EPA415.1 | Water | 3 | | |
| Total Organic Carbon/EPA415.1 | S. .i/Sediment | 20/10 | | |
| Grain Size/ASTM D422 | Soil/Sediment | 20/10 | | |
| Data package including diskette deliverables* as per CLP or attached Deliverables Requirements | | | | |

3 samples are expected to arrive at your laboratory on June 18, 1992 An additional 20 samples will arrive on June 26 and/or 29, and a final 10 samples will arrive on July 13, 1992. All applicable QA/QC analysis will be performed on our sample matrix. The preliminary data packages including a signed copy of our Chain of Custody are due at REAC on June 22, July 6, and July 17, 1992 respectively with the complete data packages due by July 7, July 21, and 8/3, 1992. If your laboratory cannot meet the delivery dates, please give best delivery date possible.

Should any questions or problems arise concerning this project, please call Debbie Weeks at (908) 632-6923. For any billing questions, please call Cindy Snyder at (908) 632-9200. Thank you.

Sincerely,

Misty Barkley

Misty Barkley
Analytical Projects Control Group Leader
Roy F. Weston, Inc. /REAC Project

MB:dw Attachments

The estimated cost for this project will be $7825.00.

cc. R. Singhvi, M. Sprenger, Central File, 4643Con.accr
V. Kansal, Subcontracting, Sample Receiving
C. Snyder, Paul Bovitz, Misty Barkley

NLI 002 1555

# ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

National Lead
Pedricktown, NJ

September 21, 1992

EPA Work Assignment No. 3-643
Weston Work Order No. 03347-033-001-4643-01
EPA Contract No. 68-03-3482

Submitted to
M. Sprenger
EPA-ERT

Richard Henry for P.B. 9/21/92
P. Bovitz — Date
Task Leader

Vinod Kansal 9/21/92
V. Kansal — Date
S. & A. Section Chief

W. S. Butterfield 9/21/92
W. S. Butterfield — Date
Project Manager

Analysis by:
REAC

Prepared by:
J. Hunter

Reviewed by:
M. Barkley

NLI 002 1556

Table of Contents



Appendices will be furnished on request

NLI 002 1557

## INTRODUCTION

REAC Laboratory, in response to ERT Work Assignment # 3-643, provided analytical services for sediment samples collected from the National Lead Site in Pedricktown, NJ. These services involved the analysis of earthworm and soil samples for lead, percent moisture, QA/QC data review, and a report summarizing the analytical procedures, results and QA/QC. The sampling dates are summarized in the following table:

| Number of Samples | Sampling Date | Date of Sample Receipt | Matrix | Analysis | Laboratory |
|---|---|---|---|---|---|
| 2 | 7/10/92 | 7/13/92 | Earthworm | Pb & % Moisture | REAC |
| 2 | 7/17/92 | 7/20/92 | Earthworm | Pb & % Moisture | REAC |
| 1 | 7/20/92 | 7/27/92 | Earthworm | Pb & % Moisture | REAC |
| 20 | 7/27/92 | 7/28/92 | Earthworm | Pb & % Moisture | REAC |
| 5 | 8/11/92 | 8/12/92 | Sediment | Pb & % Moisture | REAC |

## CASE NARRATIVE

This report summarizes the analytical results for lead analysis of earthworms and sediments for the National Lead Site in Pedrickton, NJ. A duplicate analysis was performed because there was an insufficient amount of sample 16680 to perform a matrix spike/matrix spike duplicate analysis. Furthermore, as sample 16680 is the only sample for which duplicate results have been reported both sample 16680 lead results are listed in Table 1.1.

In the matrix spike/matrix spike duplicate analysis sample 16684's percent recoveries were not calculated because the instrument response for the lead concentration for the spike and spike duplicate of sample 16684 were offscale. This sample was not re-prepared, re-digested and re-analazed because of insufficient sample.

In the matrix spike/matrix spike duplicate analysis the percent recoveries for samples 16690 and 16695 were not calculated because the sample lead concentration was much higher than the concentration of lead that was spiked into the matrix spike and the matrix spike duplicate portions of samples 16690 and 16695. These samples were not re-prepared, re-digested and re-analyzed because of insufficient sample remaining.

# ANALYTICAL PROCEDURE FOR LEAD IN EARTHWORM

All earthworm samples, except samples 16675 and 16676, were analyzed by the following procedure: One half gram of sample, weighed to 0.01 g accuracy, was thoroughly mixed with 5 ml of 1:1 nitric acid:water, and digested for 30 minutes at 60° C. It was then digested in a CEM MDS-81D microwave oven. After digestion, the sample was diluted to 25 ml with ASTM Type II water and analyzed for lead by USEPA SW-846 Method 7000 procedures on a Varian SpectrAA-400Z Atomic Absorption spectrophotometer.

Earthworm samples 16675 and 16676 were analyzed by the following procedure: One gram of sample, weighed to 0.01 g accuracy, was thoroughly mixed with 10 ml of 1:1 nitric acid:water, and digested for 30 minutes at 60° C. It was then digested in a CEM MDS-81D microwave oven. After digestion, the sample was diluted to 50 ml with ASTM Type II water and analyzed for lead by USEPA SW-846 Test Methods for Evaluating Solid Waste, USEPA, SW-846, September, 1986, Method 7000 procedures on a Varian SpectrAA-400Z Atomic Absorption spectrophotometer.

The results of the analyses are listed in Table 1.1.

# ANALYTICAL PROCEDURE FOR LEAD IN SEDIMENT

One gram of sample, weighed to 0.01 g accuracy, was thoroughly mixed with 10 ml 1:1 nitric acid:water, and digested according to procedures set forth in Method #3050 Test Methods for Evaluating Solid Waste, USEPA, SW-846, September, 1986, and then analyzed according to procedure set forth in Method 7000 Test Methods for Evaluating Solid Waste, USEPA, SW-846, September, 1986.

The results of the analyses are listed in Table 1.2.

Table 1.1

Results of the Lead and Percent Moisture Analysis of Earthworms

W.A. # 3-643 NATIONAL LEAD

(CONCENTRATIONS ARE BASED ON WET WEIGHT BASIS)

| Client # | Location: | Parameter: LEAD<br>Unit: mg/kg | MDL<br>mg/kg | MOISTURE<br>% |
|---|---|---|---|---|
| 16501 | #4 (10 day - Lumbricus) | 5.4 | 0.25 | 87 |
| 16502 | #4 (10 day - Eisenia) | 15 | 0.25 | 86 |
| 16675 | Lab Ref- MS/MSD Lumbricus | 0.74 | 0.25 | 85 |
| 16676 | Lab Ref- MS/MSD Eisenia | ND | 0.29 | 84 |
| 16692 | Loc #14 - Eisenia | 170 | 0.25 | 81 |
| 16691 | Loc #16 - Eisenia | 62 | 0.48 | 82 |
| 16690 | Loc #06 - Eisenia | 34 | 0.25 | 84 |
| 16689 | Loc #17 - Eisenia | 67 | 0.27 | 84 |
| 16688 | Loc #07 - Eisenia | 130 | 0.25 | 85 |
| 16687 | Loc #13 - Eisenia | 46 | 0.26 | 85 |
| 16686 | Loc #09 - Eisenia | 100 | 0.26 | 81 |
| 16685 | Loc #08 - Eisenia | 71 | 0.24 | 82 |
| 16684 | Loc #16 - Lumbricus | 190 | 0.22 | 83 |
| 16683 | Loc #10 - Eisenia | 76 | 0.24 | 85 |
| 16682 | Loc #15 - Eisenia | 63 | 0.25 | 85 |
| 16681 | Loc #05 - Eisenia | 52 | 0.24 | 84 |
| 16700 | Loc #01 - Eisenia | 58 | 0.26 | 84 |
| 16699 | Loc #02 - Eisenia | 48 | 0.24 | 84 |
| 16698 | Loc #04 - Eisenia | 29 | 0.26 | 86 |
| 16697 | Loc #18 - Eisenia | 140 | 0.89 | 84 |
| 16696 | Loc #10 - Lumbricus | 13 | 0.25 | 87 |
| 16695 | Loc #17 - Lumbricus | 900 | 0.24 | 85 |
| 16694 | Loc #03 - Eisenia | 130 | 0.25 | 85 |
| 16680 T1 | Loc #4 20 day Rep | 19 | 0.22 | 85 |
| 16680 T2 | Loc #4 20 day Rep | 21 | 0.22 | 85 |

| Client # | Location: | Parameter: LEAD<br>Unit: ug/L | MDL<br>ug/L |
|---|---|---|---|
| 16693 | Loc #99 - Method Blk | 12 | 5.0 |

MDL denotes method detection limit

T1 denotes test 1

T2 denotes test 2

ND denotes not detected

Table 1.2

Results of the Lead and Percent Moisture Analysis of Sediment Samples

W.A. # 3-643 NATIONAL LEAD

| Client # | Location: | LEAD (Parameter) mg/kg (Unit) | MDL mg/kg | MOISTURE % |
|---|---|---|---|---|
| D 14662 | 2 | 670 | 10 | 2 |
| D 14663 | 4 | 1100 | 10 | 3 |
| D 14664 | 5 | 53 | 10 | 2 |
| C 15875 | 8 | 4400 | 11 | 2 |
| B 15876 | 9 | 260 | 10 | 5 |

# QA/QC FOR LEAD

## Results of the EMSL Analysis for Earthworm Samples

EMSL WP 989 #1 and NBS-1566a STD was used to check the accuracy of the calibration curve. The percent recoveries for EMSL WP 989 #1 ranged from 90 to 116. All EMSL WP 989 #1 values were within the 95% confidence limit. The percent recovery for NBS-1566a STD was 113. A 95% confidence limit for NBS-1566a is not available. The recoveries are listed in Table 2.1.

## Results of the EMSL Analysis for Sediment Samples

EMSL WP 988 #19 was used to check the accuracy of the calibration curve. The percent recovery was 102. The 95% confidence limit for EMSL WP 988 #19 is not available. The recovery is listed in Table 2.2.

## Results of the Matrix Spike/Matrix Spike Duplicate Analysis for Earthworm Samples

Samples 16501, 16675, 16676, 16690, 16684, and 16695 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses for the lead analysis of earthworm samples. The percent recoveries, listed in Table 2.3, ranged from 75 to 96. The results for the spiked samples of sample 16684 were off scale and consequently are not reported. The concentrations for samples 16690 and 16695 are 20 times and 1000 times their respective spike concentrations. Consequently, the percent recoveries for samples 16690 and 16695 were not calculated.

The relative percent difference (RPD), also listed in Table 2.3, ranged from 7 to 18. The RPDs for samples 16690, 16684, and 16695 were not calculated because there were no spike recoveries associated with these samples.

## Results of the Matrix Spike/Matrix Spike Duplicate Analysis for Sediment Samples

Sample B 15876 was chosen for matrix spike/matrix spike duplicate (MS/MSD) analysis for the lead analysis of soil samples. The percent recoveries, listed in Table 2.4, were 92 and 78. The relative percent difference (RPD), also listed in Table 2.4, was 16.

## Results of the Duplicate Analysis for Earthworm Samples

There was insufficient sample to run a matrix spike/matrix spike duplicate (MS/MSD) analysis for sample 16680. Therefore, a sample duplicate analysis was performed instead. The relative percent difference (RPD), listed in Table 2.5, was 11.

## Results of the Spike Blank Analysis for Earthworm Samples

The results of the spike blank analysis for the lead analysis of earthworm samples are reported in Table 2.6. The percent recoveries ranged from 80 to 110.

## Results of the Spike Blank Analysis for Sediment Samples

The results of the spike blank analysis for the lead analysis of sediment samples are reported in Table 2.7. The percent recovery was 102.

Table 2.1
Results of the EMSL for National Lead Earthworm Samples
W.A. # 3-643 NATIONAL LEAD

| METAL | EMSL # | CONC. RECOVERED ug/l | TRUE VALUE ug/l | 95 % CONFIDENCE INTERVAL | % RECOVERY |
|---|---|---|---|---|---|
| Lead | WP 989 #1 | 46 | 50 | 38.5-59.5 | 92 |
| Lead | WP 989 #1 | 45 | 50 | 38.5-59.5 | 90 |
| Lead | WP 989 #1 | 56 | 50 | 38.5-59.5 | 112 |
| Lead | NBS-1566a STD | 0.42 | 0.371 | N/A | 113 |
| Lead | WP 989 #1 | 51 | 50 | 38.5-59.5 | 102 |
| Lead | WP 989 #1 | 58 | 50 | 38.5-59.5 | 116 |

N/A - Not Available

Table 2.2

Results of the EMSL for National Lead Sediment Samples

W.A. # 3-643 NATIONAL LEAD

| METAL | EMSL # | CONC. RECOVERED ug/l | TRUE VALUE ug/l | 95 % CONFIDENCE INTERVAL | % RECOVERY |
|---|---|---|---|---|---|
| Lead | WP 988 #19 | 1015 | 1000 | N/A | 102 |

N/A - Not Available

Table 2.3

Results of Matrix Spike/Matrix Spike Duplicate Analysis for Earthworm Samples

W.A. # 3-643 NATIONAL LEAD

| METAL | CLIENT# | SAMPLE CONC. ug/kg | ORIGINAL CONC. Spike ug/kg | ORIGINAL CONC. Dup. ug/kg | RECOVERED CONC. Spike ug/kg | RECOVERED CONC. Dup. ug/kg | % RECOVERY Spike | % RECOVERY Dup. | RPD |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 16501 | 5400 | 980 | 962 | 6225 | 6154 | 84 | 78 | 7 |
| Lead | 16675 | 743 | 1000 | 1000 | 1700 | 1550 | 96 | 81 | 17 |
| Lead | 16676 | ND | 1136 | 1163 | 1023 | 872 | 90 | 75 | 18 |
| Lead | 16690 | 34216 | 1667 | 1389 | 45667 | 45347 | NC | NC | NC |
| Lead | 16684 | 192500 | 893 | 862 | NR | NR | NC | NC | NC |
| Lead | 16695 | 902075 | 962 | 943 | 951875 | 930377 | NC | NC | NC |

NR denotes not reported because the instrument response was off scale
NC denotes not calculated

Table 2.4

Results of Matrix Spike/Matrix Spike Duplicate Analysis for Sediment Samples

W.A. # 3-643 NATIONAL LEAD

| METAL | CLIENT# | SAMPLE CONC. ug/kg | ORIGINAL CONC. Spike ug/kg | ORIGINAL CONC. Dup. ug/kg | RECOVERED CONC. Spike ug/kg | RECOVERED CONC. Dup. ug/kg | % RECOVERY Spike | % RECOVERY Dup. | RPD |
|---|---|---|---|---|---|---|---|---|---|
| Lead | B 15876 | 258720 | 228833 | 206398 | 468192 | 418989 | 92 | 78 | 16 |



NLI 002 1567

Table 2.6

Results of Spike Blank Analysis for the Earthworm Samples

W.A. # 3-643 NATIONAL LEAD

| METAL | Spike Blank ug/l | Concetration Recovered ug/l | % Spike Recovery |
|---|---|---|---|
| Lead | 20 | 17 | 85 |
| Lead | 20 | 17 | 85 |
| Lead | 20 | 23 | 105 |
| Lead | 20 | 19 | 80 |
| Lead | 20 | 23 | 110 |

Table 2.7

Results of Spike Blank Analysis for Sediment Samples

W.A. # 3-643 NATIONAL LEAD

| METAL | Spike Blank ug/kg | Concentration Recovered ug/kg | % Spike Recovery |
|---|---|---|---|
| Lead | 196078 | 199118 | 102 |

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**Roy F. Weston, Inc.**
REAC, Edison, N.J.
EPA Contract 68-03-3482

## CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6008

SHEET NO. 1 OF 1

Project Name: National Lead
Project Number: 03347-031-001-4643-00
RFW Contact: Paul Bovitz  Phone: 632-9784

071392

SAMPLE IDENTIFICATION | ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | Lead | % moisture | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 972 | 16501 | #4 (10 Day - Lumbricus) | X | 7/10/92 | 1 | 8oz glass/0°C | ✓Lead | ✓ | | |
| 973 | 16502 | #4 (10 Day - Eisenia) | X | 7/10/92 | 1 | 8oz glass/0°C | ✓Lead | ✓ | | |

Matrix:
SD - Sediment  PW - Potable Water  S - Soil
DS - Drum Solids  GW - Groundwater  W - Water
DL - Drum Liquids  SW - Surface Water  O - Oil
X - Other = tissue  SL - Sludge  A - Air

Special Instructions: Extract by 7/17/92
X = tissue (earthworm)
Analyze according to QAWP

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/ANALYSIS | Tom Johnson | 7/13/92 | [illegible signature] | 7/13/92 | 3:30 | | | | | | |
| | | | [illegible signature] | 7/13 | 4:10 | | | | | | |

NLI 002 1570

**Roy F. Weston, Inc.**
REAC, Edison, N.J.
EPA Contract 68-03-3482

# CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6165

SHEET NO. 1 OF

Project Name: National Lead
Project Number: 03347-031-001-4643-00
RFW Contact: Paul Boritz Phone: 632-9784

**SAMPLE IDENTIFICATION** / **ANALYSES REQUESTED**

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | Lead | % Moisture | MS/MSD | |
|---|---|---|---|---|---|---|---|---|---|---|
| 80 | 16675 | Lab Ref - MS MSD Lumbricus | X | 7/11/92 | 1 | 8oz glass/0°C | ✓ | ✓ | ✓ | |
| 81 | 16676 | Lab Ref - MS MSD Eisenia | X | 7/11/92 | 1 | 8oz glass/0°C | ✓ | ✓ | ✓ | |

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions: Extract by 7/24/92
X = tissue (earthworm)
Analyze according to QAWP -
* MS - MSD analysis * LAB REFERENCE

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/Analysis | [signature] | 7/2/92 | [signature] | 7/2/92 | 1:36 | | | | | | |
| 2/Analysis | [signature] | 7/2/92 | Sejal Patel | 7/2/92 | 1:45 | | | | | | |

NLI 002 1571

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

# CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6166

SHEET NO. 1 OF

Project Name: Natl Lead
Project Number: 4643
RFW Contact: Bovitz Phone: 632-9784

**SAMPLE IDENTIFICATION** / **ANALYSES REQUESTED**

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | % Moist. | Lead | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 16680 | Loc #4 20 Day Rep | X | 7/20/92 | 1 | 8oz Jar / 0°C | ✓ | ✓ | | |

**Matrix:**
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions: Analyze for lead, % moisture according to QAWP
X = tissue

FOR SUBCONTRACTING USE ONLY FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All/Analysis | J Johnson | 7/27/92 | [signature] | 7/27/92 | 11:4 | | | | | | |
| | | 7/27/92 | [signature] | | | | | | | | |
| NET 002 1522 | | | | | | | | | | | |

I reviewed DR [illegible] 7/27/92

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

072892-

# CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6233

SHEET NO. 1 OF 1

Project Name: National Lead
Project Number: 03347-031-001-4643-00
RFW Contact: Bevitz Phone: 632-9784

## SAMPLE IDENTIFICATION / ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | % Moist | Lead | Method Blank | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 211 | 16692 | Loc # 14 - Eisenia | X | 7/27/92 | 1 | 8oz jar / 10°C | ✓ | ✓ | | | |
| 212 | 16691 | Loc # 16 - Eisenia | | | | | | | | | |
| 213 | 16690 | Loc # 6 - Eisenia | | | | | | | | | |
| 214 | 16689 | Loc # 17 - Eisenia | | | | | | | | | |
| 215 | 16688 | Loc # 7 - Eisenia | | | | | | | | | |
| 216 | 16687 | Loc # 13 - Eisenia | | | | | | | | | |
| 217 | 16686 | Loc # 9 - Eisenia | | | | | | | | | |
| 218 | 16685 | Loc # 8 - Eisenia | | | | | | | | | |
| 219 | 16684 | Loc # 16 - Lumbricus | | | | | | | | | |
| 220 | 16683 | Loc # 10 - Eisenia | | | | | | | | | |
| 221 | 16682 | Loc # 15 - Eisenia | | | | | | | | | |
| 222 | 16681 | Loc # 5 - Eisenia | | | | | | | | | |
| 223 | 16700 | Loc # 1 - Eisenia | | | | | | | | | |
| 224 | 16699 | Loc # 2 - Eisenia | | | | | | | | | |
| 225 | 16698 | Loc # 4 - Eisenia | | | | | | | | | |
| 226 | 16697 | Loc # 18 - Eisenia | | | | | | | | | |
| 227 | 16696 | Loc # 10 - Lumbricus | | | | | | | | | |
| 228 | 16695 | Loc # 17 - Lumbricus | | | | | | | | | |
| 229 | 16694 | Loc # 3 - Eisenia | | | | | | | | | |
| 230 | 16693 | Loc # 99 - Method Blank | | | | | | | ✓ | | |

Matrix:
SD - Sediment
DS - Drum Solids
~~DL - Drum Liquids~~
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

X = tissue

Special Instructions: Analyze for Lead & % moisture according to QAWP

* Location 99 - Method Blank *

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All/Analysis | Tom Johnson | | [illegible] | 7/8/92 | 11:15 | | | | | | |
| | | | [illegible] | 7/9/92 | 10:20 | | | | | | |

NZ

NLI 002 1573

**Roy F. Weston, Inc.**
REAC, Edison, N.J.
EPA Contract 68-03-3482

# CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6757

SHEET NO. 1 OF 1

Project Name: NATIONAL LEAD - PHASE 2
Project Number: 3347-31-01-4643
RFW Contact: PAUL BOWD Phone: (908) 632-9200

081392-

SAMPLE IDENTIFICATION | ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/Preservative | LEAD | MS/MSD* | % MOISTURE | |
|---|---|---|---|---|---|---|---|---|---|---|
| 337 | BSD 14662 | 2 | S | 8/11/92 | 3 | 4oz XRF cups | ✓ | | ✓ | |
| 338 | BSD 14663 | 4 | ↓ | ↓ | 4 | ↓ | ✓ | | ✓ | |
| 339 | BSD 14664 | 5 | ↓ | ↓ | 3 | ↓ | ✓ | | ✓ | |
| 340 | BSD 15875 | 8 | ↓ | ↓ | ~~3~~ 4 | ↓ | ✓ | | ✓ | |
| 341 | BSD 15876 | 9 | ↓ | ↓ | 4 | XRF CUPS** | ✓ | ✓ | ✓ | |

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions: can use 15876 for ms/msd (extra or 14663 for ms/msd cup) FOR LEAD ANALYSIS

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16/ANALYSIS | [signature] | 8/12/92 | [signature] | 8/13/92 | 9:30 | | | | | | |
| | | | [signature] | 8/14/92 | 10:30 | | | | | | |

NL 002 1574

* RESERVED AT 4°C

00018

ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

National Lead
Pedricktown, NJ

October 13, 1992

EPA Work Assignment No. 3-643
Weston Work Order No. 03347-033-001-4643-01
EPA Contract No. 68-03-3482

Submitted to
M. Sprenger
EPA-ERT

Daniel Crone for P.B. 10/9/92
P. Bovitz — Date
Task Leader

Vinod Kansal 10/9/92
V. Kansal — Date
S. & A. Section Chief

W Scott Butterfield 10/9/92
W. S. Butterfield — Date
Project Manager

Analysis by:
REAC & Accredited

Prepared by:
J. Hunter

Reviewed by:
M. Barkley

NLI 002 1575

Table of Contents



Appendices will be furnished on request

NLI 002 1576

## INTRODUCTION

REAC Laboratory, in response to ERT Work Assignment # 3-643, provided analytical services for environmental samples collected from the National Lead Site in Pedricktown, NJ. These services involved the analysis of environmental samples, the sub-contracted analysis of environmental samples, QA/QC data review, and a report summarizing the analytical procedures, results and QA/QC. The sampling dates are summarized in the following table:

| COC # | Number of Samples | Sampling Date | Date of Sample Receipt | Matrix | Analysis | Laboratory |
|---|---|---|---|---|---|---|
| 6758 | 5 | 8/11/92 | 8/13/92 | Sediment | TOC | Accredited |
| | 5 | 8/11/92 | 8/13/92 | Sediment | Grain Size | Accredited |
| 6778 | 13 | 8/11/92 | 8/19/92 | Frog | Pb & % Moisture | REAC |
| | 2 | 8/18/92 | 8/19/92 | Water | Pb & % Moisture | REAC |
| 6202 | 12 | 8/26/92 | 9/1/92 | Tissue | Pb & % Moisture | REAC |
| 6203 | 12 | 8/27/92 | 9/2/92 | Tissue | Pb & % Moisture | REAC |
| 6204 | 4 | 8/27/92 | 9/3/92 | Tissue | Pb & % Moisture | REAC |
| | 8 | 8/28/92 | 9/3/92 | Tissue | Pb & % Moisture | REAC |
| 6785 | 1 | 9/3/92 | 9/3/92 | Dry Ice Residue | Pb & % Moisture | REAC |
| 6782 | 2 | 8/28/92 | 9/3/92 | Tissue | Pb & % Moisture | REAC |

## CASE NARRATIVE

There was a minor irregularity in the analysis of sediment samples for total organic carbon. There was very low level contamination of the method blank. This contamination is insignificant relative to the values found in the samples, and as a consequence does not impact upon the data quality.

## ANALYTICAL PROCEDURE FOR LEAD IN FROGS

All frog samples were analyzed by the following procedure: The entire specimen was placed with dry ice and homogenized in a stainless steel blender. The homogenate was then transferred to the original sample container, the cap was left slightly loose so that when the sample container was transferred to refrigerator the dry ice could sublimate over night. One half gram of homogenate, weighed to 0.01 g accuracy, was thoroughly mixed with 5 ml of 1:1 nitric acid:water, and digested for 30 minutes at 60° C. It was then digested in a CEM MDS-81D microwave oven. After digestion, the sample was diluted to 50 ml with ASTM Type II water and analyzed for lead by USEPA SW-846 Method 7000 procedures on a Varian SpectrAA-400Z Atomic Absorption spectrophotometer.

A rinsate blank was performed after the last sample was homogenized. Dry ice was homogenized in the blender and then transferred to a clean 8 oz sampling jar. This jar was then transferred to a refrigerator with the cap slightly loose so that the dry ice could sublimate overnight. Five ml of 1:1 nitric acid:water was added to the sample jar, transferred to a digestion vessel and digested for 30 minutes at 60° C. This rinsate was then digested in a CEM MDS-81D microwave oven. After digestion, the sample was diluted to 50 ml with ASTM Type II water and analyzed for lead by USEPA SW-846 Method 7000 procedures on a Varian SpectrAA-400Z Atomic Absorption spectrophotometer.

The results of the analyses are listed in Table 1.1.

## ANALYTICAL PROCEDURE FOR LEAD IN MICE

All mouse samples were analyzed by the following procedure: The entire specimen was placed with dry ice and homogenized in a stainless steel blender. The homogenate was then transferred to the original sample container, the cap was left slightly loose so that when the sample container was transferred to refrigerator the dry ice could sublimate over night. One half gram of homogenate, weighed to 0.01 g accuracy, was thoroughly mixed with 5 ml of 1:1 nitric acid:water, and digested for 30 minutes at 60° C. It was then digested in a CEM MDS-81D microwave oven. After digestion, the sample was diluted to 50 ml with ASTM Type II water and analyzed for lead by USEPA SW-846 Method 7000 procedures on a Varian SpectrAA-400Z Atomic Absorption spectrophotometer.

A rinsate blank was performed after the last sample was homogenized. Dry ice was homogenized in the blender and then transferred to a clean 8 oz sampling jar. This jar was then transferred to a refrigerator with the cap slightly loose so that the dry ice could sublimate overnight. Five ml of 1:1 nitric acid:water was added to the sample jar, transferred to a digestion vessel and digested for 30 minutes at 60° C. This rinsate was then digested in a CEM MDS-81D microwave oven. After digestion, the sample was diluted to 50 ml with ASTM Type II water and analyzed for lead by USEPA SW-846 Method 7000 procedures on a Varian SpectrAA-400Z Atomic Absorption spectrophotometer.

The results of the analyses are listed in Table 1.2.

ANALYTICAL PROCEDURE FOR TOTAL ORGANIC CARBON IN SEDIMENTS

The sediment samples were analyzed for total organic carbon (TOC) according to the procedures set forth in USEPA Test Methods for Water and Waste Waters Method 415.1. The results of the TOC analysis of sediments are presented in Table 1.3.

## ANALYTICAL PROCEDURE FOR GRAIN SIZE ANALYSIS OF SEDIMENTS

The sediment samples were analyzed for according to the procedures set forth in ASTM Method D422. As per instructions from REAC personnel, the hydrometer analysis was performed on the portion of the samples which passed through the 200 mesh sieve. The results of the TOC analysis of sediments are presented in Table 1.4.

Table 1.1

Results of the Lead and Percent Moisture Analysis of Frogs and the Lead Analysis of Rinsate Blanks
WA# 4643 NATIONAL LEAD

(CONCENTRATIONS ARE BASED ON WET WEIGHT BASIS)

| Client # | Location: | Parameter: LEAD Unit: mg/kg | MDL mg/kg | MOISTURE % |
|---|---|---|---|---|
| A 18196 | ES-1 | 13 | 0.50 | 78 |
| A 18197 | ES-2 | 3.9 | 0.48 | 79 |
| A 18198 | ES-3 | 3.4 | 0.45 | 83 |
| A 18199 | ES-4 | 3.6 | 0.43 | 74 |
| A 18200 | WS2A-1 | 17 | 0.43 | 81 |
| A 18201 | WS2B-2 | 2.3 | 0.48 | 80 |
| A 18202 | WS2C-3 | 23 | 0.40 | 82 |
| A 18203 | WS2D-4 | 5.2 | 0.45 | 86 |
| A 18204 | WS2E-5 | 9.4 | 0.41 | 81 |
| A 18205 | WS2F-6 | 12 | 0.49 | 80 |
| A 18206 | WS130-1 | 8.6 | 0.37 | 82 |
| A 18207 | WS130-2 | 1.4 | 0.50 | 84 |
| A 18208 | WSP-1 | 3.9 | 0.46 | 79 |

| Sample ID: | Location: | LEAD ug/L | MDL ug/L |
|---|---|---|---|
| A 18209 | NA | 11 | 5.00 |
| A 18210 | NA | ND | 5.00 |

ND denotes not detected
MDL denotes method detection limit
NA denotes not applicable

Table 1.2

Results of the Lead and Percent Moisture Analysis of Mice and the Lead Analysis of Rinsate Blanks
WA# 4643 NATIONAL LEAD

(CONCENTRATIONS ARE BASED ON WET WEIGHT BASIS)

| Client # | Location: Parameter: / Unit: | LEAD mg/kg | MDL mg/kg | MOISTURE % |
|---|---|---|---|---|
| A 18108 | III-14-10 | 1.2 | 0.18 | 30 |
| A 18109 | III-12-2 | 3.3 | 0.18 | 31 |
| A 18110 | III-1-4 | 7.3 | 0.16 | 32 |
| A 18111 | I-3-4 | 2.7 | 0.18 | 32 |
| A 18112 | III-12-10 | 4.4 | 0.15 | 31 |
| A 18113 | III-5-10 | 4.6 | 0.20 | 32 |
| A 18114 | II-8-9 | 3.4 | 0.17 | 30 |
| A 18115 | II-15-1 | 1.1 | 0.19 | 27 |
| A 18116 | III-8-3 | 2.6 | 0.18 | 31 |
| A 18117 | III-8-6 | 13 | 0.18 | 26 |
| A 18120 | II-10-10 | 2.3 | 0.16 | 30 |
| A 18123 | III-1-8 | 6.1 | 0.20 | 32 |
| A 18124 | IA-7-4 | 3.3 | 0.21 | 69 |
| A 18125 | IA-5-9 | 0.74 | 0.21 | 72 |
| A 18126 | IA-7-5 | 0.94 | 0.21 | 68 |
| A 18127 | IA-5-3 | 0.71 | 0.20 | 69 |
| A 18128 | IA-5-10 | 0.40 | 0.20 | 68 |
| A 18129 | II-9-3 | 2.2 | 0.19 | 68 |
| A 18130 | IA-10-10 | 0.20 | 0.20 | 70 |
| A 18131 | II-9-1 | 2.9 | 0.16 | 70 |
| A 18132 | III-1-5 | 4.1 | 0.19 | 69 |
| A 18133 | II-1-8 | 1.7 | 0.20 | 69 |
| A 18134 | III-13-4 | 1.5 | 0.20 | 69 |

ND denotes not detected
MDL denotes method detection limit

Table 1.2 (continued)

Results of the Lead and Percent Moisture Analysis of Mice and the Lead Analysis of Rinsate Blanks
WA# 4643 NATIONAL LEAD

(CONCENTRATIONS ARE BASED ON WET WEIGHT BASIS)

| | Parameter: | LEAD | MDL | MOISTURE |
|---|---|---|---|---|
| | Unit: | mg/kg | mg/kg | % |
| Client # | Location: | | | |
| A 18135 | IA-0-2 | 2.6 | 0.18 | 67 |
| A 18136 | III-10-7 | 0.89 | 0.18 | 71 |
| A 18137 | I-13-7 | 1.6 | 0.18 | 69 |
| A 18138 | III-12-8 | 8.3 | 0.19 | 68 |
| A 18139 | II-15-10 | 2.8 | 0.17 | 70 |
| A 18145 | II-15-10 | 1.6 | 0.19 | 69 |
| A 18146 | II-9-1 | 13 | 0.19 | 69 |
| A 18147 | II-12-1 | 6.1 | 0.17 | 71 |
| A 18148 | II-9-1 | 0.87 | 0.22 | 69 |
| A 18149 | IA-7-8 | 1.9 | 0.21 | 66 |
| A 18150 | II-9-9 | 3.4 | 0.21 | 71 |
| A 18151 | II-10-1 | 1.7 | 0.20 | 68 |
| A 18152 | I-0-4 | 2.5 | 0.21 | 70 |
| A 18153 | II-10-1 | 1.9 | 0.18 | 70 |
| A 18154 | II-5-1 | 1.5 | 0.19 | 70 |
| Sample ID: | Location: | LEAD: (ug/L) | MDL (ug/L) | |
| A 18160 | NA | ND | 2.0 | - |

ND denotes not detected
MDL denotes method detection limit
NA denotes not applicable

Table 1.3
Results of the Total Organic Carbon Analysis of Sediments
WA # 3-643, National Lead
(Results on a Dry Weight Basis)

| Sample ID | Location | Result (mg/Kg) | Method Detection Limit (mg/Kg) |
|---|---|---|---|
| Blank | - | 3 * | 1 * |
| A 14662 | 2 | 150000 | 390 |
| A 14663 | 4 | 85000 | 360 |
| A 14664 | 5 | 4800 | 160 |
| A 15875 | 8 | 160000 | 630 |
| A 15876 | 9 | 66000 | 230 |

ND denotes not detected
* denotes that the units for this sample are mg/L

Table 1.4

Results of the Grain Size Analysis of Sedients

WA #3-643, National Lead

| Sample ID: | E14662 | E14663 | E14664 | E15875 | E15876 |
|---|---|---|---|---|---|
| Location: | #2 | #4 | #5 | #8 | #9 |
| Sieve Size (mesh) | % Retained | % Retained | % Retained | % Retained | % Retained |
| 4 | 0 | 4.43 | 0.01 | 0 | 0.17 |
| 10 | 0 | 0 | 1.92 | 0 | 0.17 |
| 30 | 0 | 1.39 | 20.49 | 2.82 | 9.13 |
| 50 | 8.55 | 7.69 | 48.32 | 16.02 | 31.13 |
| 100 | 8.88 | 19.46 | 20.86 | 16.02 | 24.74 |
| 200 | 5.92 | 18.14 | 3.6 | 21.48 | 19.71 |
| Passing 200 | 76.64 | 48.89 | 4.67 | 43.66 | 14.94 |

| Diameter (mm) | % Passing | % Passing | % Passing | % Passing | % Passing |
|---|---|---|---|---|---|
| 0.0352 | | | 79.14 | | |
| 0.0341 | 80.27 | | | 76.64 | |
| 0.0322 | | | | | 78.89 |
| 0.0278 | | | | | |
| 0.0271 | | 85.81 | | | |
| 0.0235 | | | 28.26 | | |
| 0.0228 | 42.24 | | | | 28.18 |
| 0.0230 | | | | 36.3 | |
| 0.0210 | | 41.99 | | | |
| 0.0136 | | | 22.61 | | |
| 0.0135 | | | | 24.2 | 16.9 |
| 0.0133 | 33.8 | | | | |
| 0.0126 | | 31.04 | | | |
| 0.0097 | | | 16.96 | | |
| 0.0096 | | | | 16.14 | 11.27 |
| 0.0095 | 25.35 | | | | |
| 0.0092 | | 21.91 | | | |
| 0.0069 | | | 11.3 | 12.1 | |
| 0.0068 | | | | | 8.45 |
| 0.0067 | 25.35 | | | | |
| 0.0066 | | 18.26 | | | |
| 0.0034 | | | 5.65 | 8.07 | 5.63 |
| 0.0033 | 8.45 | 9.13 | | | |
| 0.0014 | 4.22 | 3.65 | 0 | 0 | 0 |

## QA/QC FOR LEAD

### Results of the EMSL Analysis for Frog Samples

EMSL WP 989 #1 was used to check the accuracy of the calibration curve. The percent recovery for EMSL WP 989 #1 was 100. This EMSL WP 989 #1 value was within the 95% confidence limit. The recovery is listed in Table 2.1.

### Results of the EMSL Analysis for Mouse Samples

EMSL WP 989 #1 was used to check the accuracy of the calibration curve. The percent recoveries for EMSL WP 989 #1 were 86 and 90. These EMSL WP 989 #1 values were within the 95% confidence limit. The recoveries are listed in Table 2.2.

### Results of the Matrix Spike/Matrix Spike Duplicate Analysis for Frog Samples

Samples A 18196 (which was used twice) and A 18207 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses for the lead analysis of frog samples. The percent recoveries, listed in Table 2.3, ranged from 54 to 91. The relative percent difference (RPD), also listed in Table 2.3, ranged from 2 to 5. Quality assurance criteria are not available for lead analysis of tissues.

### Results of the Matrix Spike/Matrix Spike Duplicate Analysis for Mouse Samples

Samples A 18115, A 18117, A 18124, A 18125, A 18145, and A 18146 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses for the lead analysis of mouse samples. Sample A 18146's matrix spike was not recovered. This was probably because Sample A 18146's matrix spike was inadvertantly not spiked. As a consequence, the recovery for Sample A 18146's matrix spike and the relative percent difference for Sample A 18146 were not calculated. The percent recoveries, listed in Table 2.4, ranged from 69 to 129. The relative percent difference (RPD), also listed in Table 2.4, ranged from 2 to 24. Quality assurance criteria are not available for lead analysis of tissues.

### Results of the Spike Blank Analysis for Frog Samples

The results of the spike blank analysis for the lead analysis of frog samples are reported in Table 2.5. The percent recoveries ranged from 78 to 87. Quality assurance criteria are not available for lead analysis of tissues.

### Results of the Spike Blank Analysis for Mouse Samples

The results of the spike blank analysis for the lead analysis of frog samples are reported in Table 2.6. The percent recoveries ranged from 92 to 96. Quality assurance criteria are not available for lead analysis of tissues.

Table 2.1

Results of the EMSL for Frog Samples

WA # 3-640, National Lead

| METAL | EMSL # | CONC. RECOVERED ug/l | TRUE VALUE ug/l | 95 % CONFIDENCE INTERVAL | % RECOVERY |
|---|---|---|---|---|---|
| Lead | WP 989 #1 | 50 | 50 | 38.5-59.5 | 100 |

Table 2.2

Results of the EMSL for Mouse Samples

WA # 3-640, National Lead

| METAL | EMSL # | CONC. RECOVERED ug/l | TRUE VALUE ug/l | 95 % CONFIDENCE INTERVAL | % RECOVERY |
|---|---|---|---|---|---|
| Lead | WP 989 #1 | 43 | 50 | 38.5-59.5 | 86 |
| Lead | WP 989 #1 | 45 | 50 | 38.5-59.5 | 90 |

Table 2.3

Results of the Matrix Spike/Matrix Spike Duplicate Analysis for Frog Samples

WA # 3-643 National Lead

| METAL | CLIENT# | SAMPLE CONC. ug/kg | ORIGINAL CONC. Spike ug/kg | ORIGINAL CONC. Dup. ug/kg | RECOVERED CONC. Spike ug/kg | RECOVERED CONC. Dup. ug/kg | % RECOVERY Spike | % RECOVERY Dup. | RPD |
|---|---|---|---|---|---|---|---|---|---|
| Lead | A 18196 | 12800 | 5000 | 5000 | 17000 | 16800 | 84 | 80 | 5 |
| | A 18196 | 12800 | 16949 | 18182 | 22034 | 22909 | 54 | 56 | 2 |
| Lead | A 18207 | 1373 | 4808 | 5000 | 5769 | 5800 | 91 | 89 | 3 |

Table 2.4

Results of the Matrix Spike/Matrix Spike Duplicate Analysis for Mouse Samples

WA # 3-643 National Lead

| METAL | CLIENT# | SAMPLE CONC. ug/kg | ORIGINAL CONC. Spike ug/kg | ORIGINAL CONC. Dup. ug/kg | RECOVERED CONC. Spike ug/kg | RECOVERED CONC. Dup. ug/kg | % RECOVERY Spike | % RECOVERY Dup. | RPD |
|---|---|---|---|---|---|---|---|---|---|
| Lead | A 18115 | 1111 | 4630 | 4630 | 4907 | 5000 | 82 | 84 | 2 |
| Lead | A 18117 | 12807 | 4237 | 4464 | 17119 | 18571 | 102 | 129 | 24 |
| Lead | A 18124 | 3333 | 5000 | 5000 | 7600 | 7308 | 85 | 80 | 7 |
| Lead | A 18125 | 745 | 4808 | 4902 | 4808 | 4706 | 85 | 81 | 4 |
| Lead | A 18145 | 1635 | 4237 | 4386 | 5254 | 4649 | 85 | 69 | 22 |
| Lead | A 18146 | 13019 | 5208 | 4464 | * | 17411 | NC | 98 | NC |

* denotes that the spike was not recovered (probably an error in spiking sample)
NC denotes not calcualted

Table 2.5

Results of Spike Blank Analysis for Frog Samples

WA # 3-643 National Lead

| METAL | Method Blank | Spike Blank ug/l | Concentration Recovered ug/l | % Spike Recovery |
|---|---|---|---|---|
| Lead | 4 | 50 | 43 | 78 |
| Lead | 1 | 200 | 175 | 87 |
| Lead | 0 | 1000 | 850 | 85 |

Table 2.6

Results of Spike Blank Analysis for Mouse Samples

WA # 3-643 National Lead

| METAL | Method Blank | Spike Blank ug/l | Concentration Recovered ug/l | % Spike Recovery |
|---|---|---|---|---|
| Lead | 1 | 50 | 49 | 96 |
| Lead | 0 | 50 | 46 | 92 |
| Lead | 0 | 50 | 47 | 94 |
| Lead | 0 | 50 | 46 | 92 |

## QA/QC FOR TOC

Results of the Matrix Spike/Matrix Spike Duplicate Analysis for Sediment Samples

A non-ERT/REAC sample, 9205049, was chosen for the matrix spike/matrix spike duplicate analysis for the total organic carbon analysis of sediments. The recoveries were 84 and 87, and are listed in Table 2.7. The relative percent difference is 4. Because this sample is from a different matrix set, the results of the MS/MSD for TOC do not reflect on the quality of the ERT/REAC samples.

Table 2.7

Results of the Matrix Spike/Matrix Spike Duplicate Analysis for TOC Sediment Samples

WA # 3-643 National Lead

| ANALYTE | Sample ID | SAMPLE CONC. ug/kg | ORIGINAL CONC. Spike ug/kg | ORIGINAL CONC. Dup. ug/kg | RECOVERED CONC. Spike ug/kg | RECOVERED CONC. Dup. ug/kg | % RECOVERY Spike | % RECOVERY Dup. | RPD |
|---|---|---|---|---|---|---|---|---|---|
| TOC | 9205049 | ND | 293 | 294 | 245 | 255 | 84 | 87 | 4 |

ND denotes not detected

00020

NLI 002 1596

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

## CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 67_3

SHEET NO. 1 OF

Project Name: NATIONAL LEAD-PHASE 2
Project Number: 3347-31-01-4643
RFW Contact: PAUL BONITZ Phone: (908)632-9200
DEBBIE WEEKS

| SAMPLE IDENTIFICATION | | | | | | | ANALYSES REQUESTED | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | TOC | GRAIN SIZE | | |
| | A 14662 | 2 920605 | SD | 8/11/92 | 1 | 4oz | ✓ | | | |
| | A 14663 | 4 920605 | | | 1 | 4oz | ✓ | | | |
| | A 14664 | 5 920605 | | | 1 | 4oz | ✓ | | | |
| | E 14662 | 2 920605 | | | 1 | 32oz | | ✓ | | |
| | E 14663 | 4 920605 | | | 1 | 32oz | | ✓ | | |
| | E 14664 | 5 920605 | | | 1 | 32oz | | ✓ | | |
| | A 15875 | 8 | | | 1 | 4oz | ✓ | | | |
| | A 15876 | 9 | | | 1 | 4oz | ✓ | | | |
| | E 15875 | 8 | | | 1 | 32oz | | ✓ | | |
| | E 15876 | 9 | | | 1 | 32oz | | ✓ | | |

**Matrix:**
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PB 1-10 Analysis | [signature] | 8/12/92 | | | | | FedEx | 8/13/92 | Lori Simko | 8/13/92 | 9:30 |
| | | | | | | | | | | | |

NLI 002 1597

**Roy F. Weston, Inc.**
REAC, Edison, N.J.
EPA Contract 68-03-3482

## CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6785

Project Name: National Lead
Project Number: 3347-31-01-4643
RFW Contact: Paul Bonitz Phone: 908-632-9784

SHEET NO. 1 OF 1

090392 -

**SAMPLE IDENTIFICATION** / **ANALYSES REQUESTED**

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | Lead | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 776 | A18160 | NA | X | 9/3/92 | 1 | 8oz glass/0°C | X | | | |
| PK | ~~A18161~~ | ~~NA~~ | ~~X~~ | ~~9/3/92~~ | ~~1~~ | ~~8oz glass/0°C~~ | ~~X~~ | | | |

**Matrix:**
SD - Sediment; PW - Potable Water; S - Soil
DS - Drum Solids; GW - Groundwater; W - Water
DL - Drum Liquids; SW - Surface Water; O - Oil
X - Other; SL - Sludge; A - Air

X = dry ice residue

Special Instructions: Method blank is a result of homogenization minus tissue.
① Shake jar w/ DI water
② Digest and analyze for lead.

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PK 1/Analysis | Phil Kim | 9/3/92 | Robert Reed | 9/3/92 | 11:35 | | | | | | |
| | | | Tony Smith | 9/3 | 12:00 | | | | | | |
| | | | ~~[illegible]~~ | 9/7/92 | | | | | | | |

NLI 002 1598

Peer reviewed: KM

00022

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

# CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6782

SHEET NO. 1 OF 1

Project Name: National Lead
Project Number: 3347-31-01-4643
RFW Contact: Paul Bovitz Phone: 908-632-9784

090392

SAMPLE IDENTIFICATION / ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | LEAD | % moisture | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 774 | A18153 | II-10-1 | X | 8/28/92 | 1 | 8oz glass/0°C | X | X | | |
| 775 | A18154 | II-5-1 | X | 8/28/92 | 1 | ↓ | X | X | | |

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

X = tissue

Special Instructions: Priority of Analyses:
1) Lead
2) % moisture

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-2/Analysis | Phil Ke | 8/31/92 | Robert Reed | 8/31/92 | 1:30pm | | | | | | |
| | | | Terry Satter | 9/3 | 12:00 | | | | | | |
| | | | [illegible] | 9/7/92 | | | | | | | |

00023

NLI 002 1599

Peer reviewed: [illegible]

**Roy F. Weston, Inc.**
REAC, Edison, N.J.
EPA Contract 68-03-3482

090392

## CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6204

SHEET NO. 1 OF 1

Project Name: National Lead
Project Number: 3347-31-01-4643
RFW Contact: Paul Bonitz Phone: 908-632-9784

SAMPLE IDENTIFICATION — ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | LEAD | % moisture | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 762 | A18136 | III-10-7 | X | 8/27/92 | 1 | 8oz glass / 0°C | X | X | | |
| 763 | A18137 | I-13-7 | | | | | | | | |
| 764 | A18138 | III-12-8 | | | | | | | | |
| 765 | A18139 | II-15-10 | | | | | | | | |
| 766 | A18145* | II-15-10 | | 8/28/92 | | | | | | |
| 767 | A18146* | II-9-1 | | | | | | | | |
| 768 | A18147 | II-12-1 | | | | | | | | |
| 769 | A18148 | II-9-1 | | | | | | | | |
| 770 | A18149 | IA-7-8 | | | | | | | | |
| 771 | A18150 | II-9-4 | | | | | | | | |
| 772 | A18151 | II-10-1 | | | | | | | | |
| 773 | A18152 | I-0-4 | | | | | | | | |

00024

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air
X = tissue

Special Instructions: Priority of Analyses;
① Lead
② % moisture
* Use for MS/MSD's

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-12/Analysis | Phil Kim | 8/31/92 | Robert Amd | 8/31/92 | | | | | | | |
| | | | [illegible] | 9/3 | 9:00 | | | | | | |
| | | | ~~[illegible]~~ | 9/7/92 | | | | | | | |

NLI 002 1600

Post reviewed: KM

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

# CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6203

Project Name: National Lead
Project Number: 3347-31-01-4643
RFW Contact: Paul Bovitz Phone 908-632-9784

SHEET NO. 1 OF 1

090292

SAMPLE IDENTIFICATION / ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | LEAD | % MOISTURE | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 726 | A18124* | IA-7-4 | X | 8/27/92 | 1 | 8oz glass/0°C | X | X | | |
| 727 | A18125* | IA-5-9 | | | | | | | | |
| 728 | A18126 | IA-7-5 | | | | | | | | |
| 729 | A18127 | IA-5-3 | | | | | | | | |
| 730 | A18128 | IA-5-10 | | | | | | | | |
| 731 | A18129 | II-9-3 | | | | | | | | |
| 732 | A18130 | IA-10-10 | | | | | | | | |
| 733 | A18131 | II-9-1 | | | | | | | | |
| 734 | A18132 | III-1-5 | | | | | | | | |
| 735 | A18133 | II-1-8 | | | | | | | | |
| 736 | A18134 | III-13-4 | | | | | | | | |
| 737 | A18135 | IA-0-2 | | | | | | | | |

00025

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other X = tissue
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions: Priority of Analyses:
① Lead
② % moisture
* Use for MS/MSD's

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-12/Analysis | Phil Kim | 8/31/92 | Robert Ford | 8/31/92 | | | | | | | |
| | | | Tony Santos | 9/2/92 | 930 | | | | | | |
| | | | [signature] | 09/07/92 | | | | | | | |

NLI 002 1601

Peer reviewed: KW

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

## CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6202

SHEET NO. 1 OF 1

Project Name: National Lead
Project Number: 3347-31-01-4643
RFW Contact: Paul Bovitz Phone: 908-632-9784

**SAMPLE IDENTIFICATION** / **ANALYSES REQUESTED**

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | LEAD | % MOISTURE | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 710 | A18108 | III-14-10 | X | 8/26/92 | 1 | 8oz glass / 0°C | X | | | |
| 711 | A18109 | III-12-2 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 712 | A18110 | III-1-4 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 713 | A18111 | I-3-4 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 714 | A18112 | III-12-10 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 715 | A18113 | III-5-10 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 716 | A18114 | II-8-9 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 717 | A18115* | II-15-1 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 718 | A18116 | III-8-3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 719 | A18117* | III-8-6 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 720 | A18120 | II-10-10 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| 721 | A18123 | III-1-8 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |

**Matrix:**
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

X = tissue

Special Instructions: Priority for analyses:
1) Lead
2) % moisture

*USE FOR MS / MSD's

FOR SUBCONTRACTING USE ONLY FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-12/Analysis | [signature] | 8/31/92 | [signature] | 8/31/92 | | | | | | | |
| | | | [signature] | 9/1 | 11:00 | | | | | | |
| | | | [signature] | 9/1/92 | 1:20 | | | | | | |

NLI 002 1602

Peer reviewed by: KM

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

081992

# CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 6778

SHEET NO. 1 OF 1

Project Name: NATIONAL LEAD
Project Number: 03347-031-001-4643
RFW Contact: Paul Boyitz Phone: 632-4784

SAMPLE IDENTIFICATION / ANALYSES REQUESTED

| REAC # | Sample No. | Sampling Location | Matrix | Date Collected | # of Bottles | Container/ Preservative | Lead | % moisture | MS/MSD |
|---|---|---|---|---|---|---|---|---|---|
| 455 | A18196 | ES-1 | X | 8/11/92 | 1 | 8oz glass / 0°C DRY ICE | X | X | X |
| 456 | A18197 | ES-2 | ↓ | ↓ | ↓ | ↓ | X | X | |
| 457 | A18198 | ES-3 | | | | | X | X | |
| 458 | A18199 | ES-4 | | | | | X | X | |
| 459 | A18200 | WS2A-1 | | | | | X | X | |
| 460 | A18201 | WS2B-2 | | | | | X | X | |
| 461 | A18202 | WS2C-3 | | | | | X | X | |
| 462 | A18203 | WS2D-4 | | | | | X | X | |
| 463 | A18204 | WS2E-5 | | | | | X | X | |
| 464 | ~~A126~~ A18205 | WS2F-6 | | | | | X | X | |
| 465 | A18206 | WS130-1 | | | | | X | X | |
| 466 | A18207 | WS130-2 | | | | | X | X | X |
| 467 | A18208 | WSP-1 | ↓ | ↓ | | | X | X | |
| 468 | A18209 | NA | W | 8/18/92 | | | X | | |
| 469 | A18210 | NA | W | 8/18/92 | ↓ | ↓ | X | | |

00027

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other Frog Tissue
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions: Analysis of lead is 1st priority, % moisture is second in priority. Run MS/MSD at 3 different concentrations: low, med, & high.

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

| Items/Reason | Relinquished By | Date | Received By | Date | Time | Items/Reason | Relinquished By | Date | Received By | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All/Analysis | [signature] | 8/19 | Robert [signature] | 8/19 | 11:00 | | | | | | |
| | | | [signature] | 8/19 | 11:00 | | | | | | |
| | | | [signature] | 8/19 | 11:45 | | | | | | |

NLI 002 1603

Peer reviewed by Phil Kim 8/19/92

WESTON
MANAGERS DESIGNERS CONSULTANTS
ROY F. WESTON, INC./REAC
GSA RARITAN DEPOT
2890 WOODBRIDGE AVENUE
BLDG. 209 ANNEX
EDISON, NJ 08837-3679
908-632-9200 • FAX: 908-632-9205

June 18,1992

Accredited
Foot of Pershing Ave
P.O. Box 369
Carteret, NJ 07008-0369

Attn: Regina Metcalf/Mark Petegrew
Re: Project # 3347-31-01-4643, National Lead

As per Weston REAC Purchase Order number 08-81942, dated 06/18/92,please analyze samples according to the following parameters:

| Analysis/Method | Matrix | # of samples | Unit Cost | Total |
|---|---|---|---|---|
| Total Organic Carbon/EPA415.1 | Water | 3 | | |
| Total Organic Carbon/EPA415.1 | Soil/Sediment | 20/10 | | |
| Grain Size/ASTM D422 | Soil/Sediment | 20/10 | | |
| Data package including diskette deliverables* as per CLP or attached Deliverables Requirements | | | | |

3 samples are expected to arrive at your laboratory on June 18, 1992 An additional 20 samples will arrive on June 26 and/or 29, and a final 10 samples will arrive on July 13, 1992. All applicable QA/QC analysis will be performed on our sample matrix. The preliminary data packages including a signed copy of our Chain of Custody are due at REAC on June 22, July 6, and July 17, 1992 respectively with the complete data packages due by July 7, July 21, and 8/3, 1992. If your laboratory cannot meet the delivery dates, please give best delivery date possible.

Should any questions or problems arise concerning this project, please call Debbie Weeks at (908) 632-6923. For any billing questions, please call Cindy Snyder at (908) 632-9200. Thank you.

Sincerely,

Misty Barkley

Misty Barkley
Analytical Projects Control Group Leader
Roy F. Weston, Inc. /REAC Project

MB:dw Attachments

cc. R. Singhvi
M. Sprenger
Central File
4643Con.accr
V. Kansal
Subcontracting
Sample Receiving
C. Snyder
Paul Bovitz
Misty Barkley

NLI 002 1604